# THE IRON AGE

**A Review of the Hardware, Iron, Machinery [illegible] les.**

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# THE IRON AGE

THURSDAY, JANUARY 8, 1903

## The Duquesne Works of the Carnegie Steel Company.—II.*

### The Merchant Bar Mill.

The Carnegie Steel Company have been operating their new merchant mill department at the Duquesne plant for several months. As this new department is fitted up more generously than any other plant for that class of work a brief description may prove of interest The problem was to roll rounds from ⅜ to 1½ inches in diameter and equivalent flats with the maximum uniformity of section and minimum cost of waste (both in crop ends and in oxidation), of fuel (both for steam and for heating) and of nonproductive labor.

To make uniformity of section possible the mill must obviously be more than merely stiff. No rolls can be so held but that they will spring many thousandths of an inch. All skilled rollers and inspectors know what may perhaps be called the personal equation of their own mill, or, in other words, they can tell about how long bars they can roll of different sizes and not have the last end over, say, 5-1000 to 10-1000 inch larger than the first end, due to extra stiffness of last end, which has necessarily been out of the furnace as much longer than the first end as it takes the bar to make the last pass. On old mills this limitation kept the length of bars down to, say, 50 to 150 feet.

The way to escape this limitation in length was to secure uniform heat treatment for the entire length of the bar at each pass. This uniformity is secured by use of the continuous system of rolling from long billets, whereby the last end of the billet stays in the furnace until after many passes have been made on the first end. This called for a supply of long (30-foot) billets.

The merchant mills occupy part of the north yard of the Duquesne Works, the Union Railroad forming the connecting link along the river bank between the two yards. The plant consists of a boiler house, a billet storage transept, a crane room transept, a furnace room with two furnaces, a mill room with one 13-inch and one 10-inch mill and 100-foot crane, a warehouse containing also two 450-foot cooling beds and a shipping transept containing special shears, &c.

At the merchant mills the 30-foot billets are unloaded from the cars by means of a double-lift electric crane after passing two chains about a 15-ton bundle of billets. The bundles are then lowered into the stock pile and the chains are left on. By thus leaving the chains on the bundle is picked up when wanted without delay, and even if at the bottom of the pile can be secured with but slight delay or expense. When wanted the bundle is placed on an elevated cradle (see Fig. 1) and the chains dropped off. The individual billets are then by means of a hand wrench rolled on a small conveyor table, which automatically feeds them into the corresponding furnace.

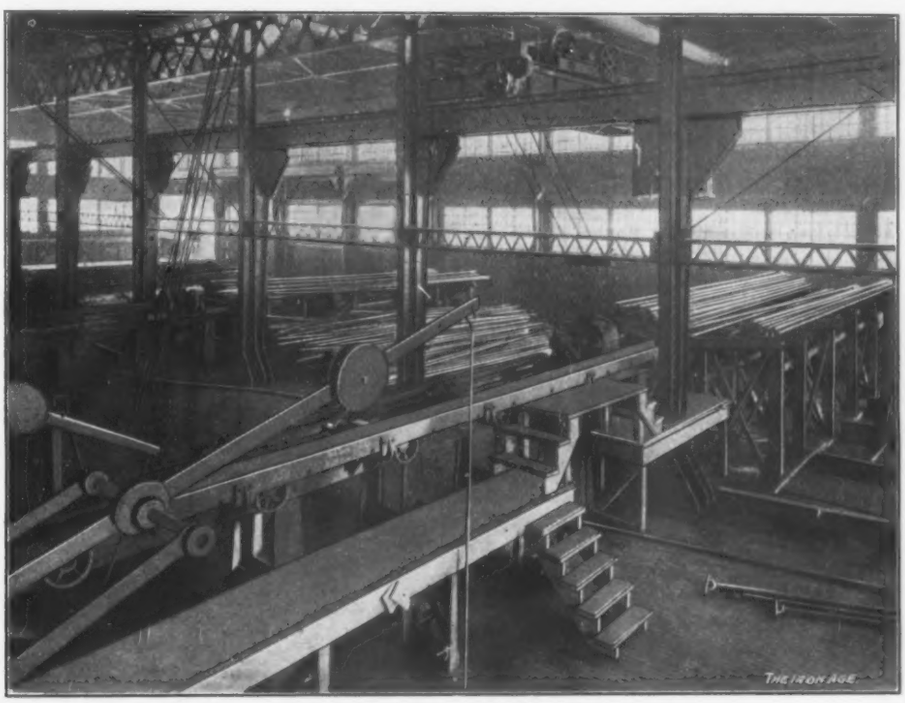



*Fig. 1.—Billet Storage, Showing Bundles of Billets with Chains Left On, Elevated Billet Cradles and Furnace Charging Roll Tables.*

THE DUQUESNE MERCHANT BAR MILL.

The furnaces are continuous, about 32 feet square inside, with suspended roofs. Natural gas is used as fuel. Although these furnaces are so large, complete control is secured by use of some 15 air and gas valves. The discharging door of each furnace is close to the first pair of rolls of a four-train continuous roughing mill, as shown in Fig. 2. The two mills are entirely distinct and disconnected from each other. The heavier mill has ten stands of 13-inch rolls; the lighter mill has ten stands of 10-inch rolls.

There are many peculiarities about the finishing

* Concluded from *The Iron Age*, January 1, 1903, page 12.

mills. Not only the four-train roughing, but also the six stands of the finishing rolls, are all pure two-high "bull heads." This secures maximum rigidity and simplicity. The 13-inch and 10-inch roughing mills are of similar design, direct driven by spur gearing from the overhanging ends of engine shafts. The engines are each 30 x 54 x 48 inch Buckeye tandem compound condensing. Each belts back to drive the finishing trains.

The 13-inch finishing train, Fig. 2, is composed of two trains, each of three stands of two-high rolls and one stand of two-high pinions, the engine driving a jack shaft, which is coupled to the upper pinion of one train and through the three upper rolls to the lower pinion of the second train. Thus the three pairs of rolls on one side of the central pair of pinions all run in the same direction and opposite to the three pairs at the other end. This arrangement renders possible repeaters of very large radius.

It will be seen that the 30-foot billet, after being roughed down, is led between a pair of feed rolls, seen at bottom of slope, Fig. 2, and around a repeater into No. 1 finishing pass, around a second repeater into No. 2 pass and on to No. 6 pass, from which it passes up through a pipe into a long trough leading to the cooling bed. Twist delivery guides are used at each pass and thus the finishing train becomes an automatic mill with repeaters on both sides.

The 10-inch finishing mill, Fig. 3, is composed of three trains of two stands each, of pure two-high bull heads, each pair of rolls having its own pair of two-high pinions. The three trains are connected to three jack shafts, which are driven by a single belt from the engine. The first ends of the bars are turned into the six passes by as many men and the finished bar passes through the pipe shown at the left to the cooling bed.

On this mill all the speeds are so arranged that the loops grow but little, if any. This is secured not only by driving the three trains at different speeds, but by having the first pair of rolls and pinions in each train 9½ inches in diameter and the second pair 10½ inches in diameter.

The two cooling beds, Fig. 4, are similar, except that the 13-inch is heavier and wider than the 10-inch. Each is 450 feet long and is made of five elements—a run out conveyor, a stretcher engine with opposing grip, a gravity cooling bed, an assembling table with transfer push-

*Fig. 2.—Thirteen-Inch Mill, Showing Morgan Continuous Furnace, Roughing Mill and Edwards Automatic Finishing Train.*

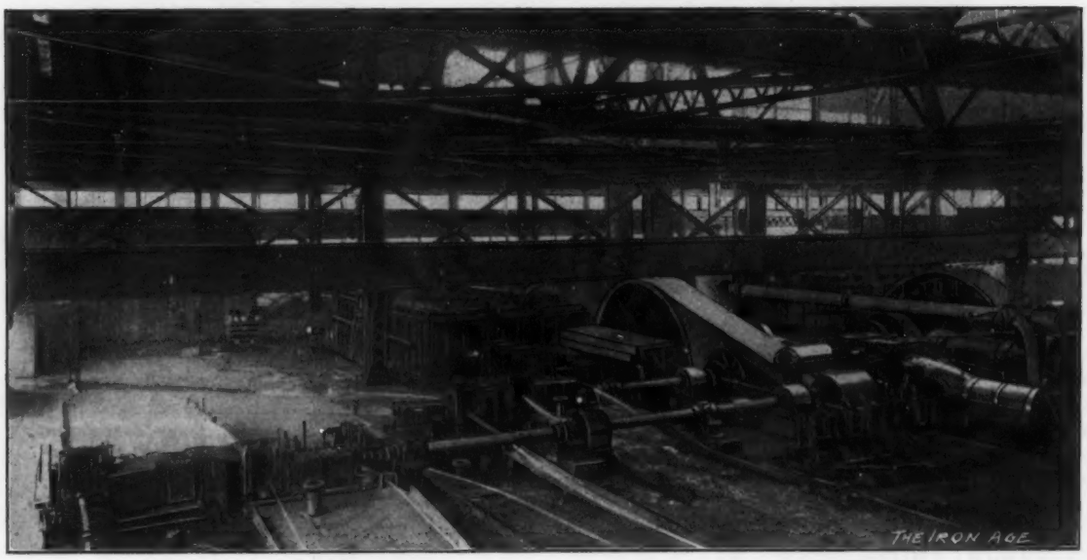



*Fig. 3.—Ten-Inch Mill, Showing Morgan Continuous Furnace and Roughing Mill and Edwards Six-Speed Hand Finishing Trains.*

THE DUQUESNE MERCHANT BAR MILL.

ers and a driven roller shear table. Each element is 450 feet long. The run out conveyor is of novel construction, which may be observed by reference to Fig. 4, which shows the conveyor with three plates removed. The advancing bar runs in the trough, being carried on the tops of the driven conveyor rolls, which project through the plates in the usual manner. The peculiarity comes in the conveyor rolls, which are conical, with the upper face horizontal. The axes of the rolls are slightly out of square with the advancing bar, the points of the rolls being slightly ahead of the bases. This causes the bar to closely hug the large end of the cone and hence travel at the maximum speed.

It is important to stop the advancing bar with the first end within 2 feet of the far end of the bed. The speed is very high and the bars follow each other often with less than five seconds clearance. To make this stop the bar is first transferred to the small end of the cones, where the speed is very slow, and the bar is lifted out of the trough by rocking the cooling bed escapement racks, each of which carries a bent wing at its upper end. Normally this wing lies below the bottom of the trough. When rocked to the other position it stands at a slope of 30 degrees and causes the bar to slide down against the first line of stops, in which position it is caught at each end and slightly stretched to remove any trace of small short bends or kinks.

To return to the cone rolls, the bars are transferred broadside by changing the angle of the axes of the rolls with relation to the bar. This causes the bar to cross over to the points of the rolls. Near the points there is an abrupt shoulder. As soon as the bar drops over this shoulder the rolls are at once moved back to their first position and are ready for the next bar. The previous

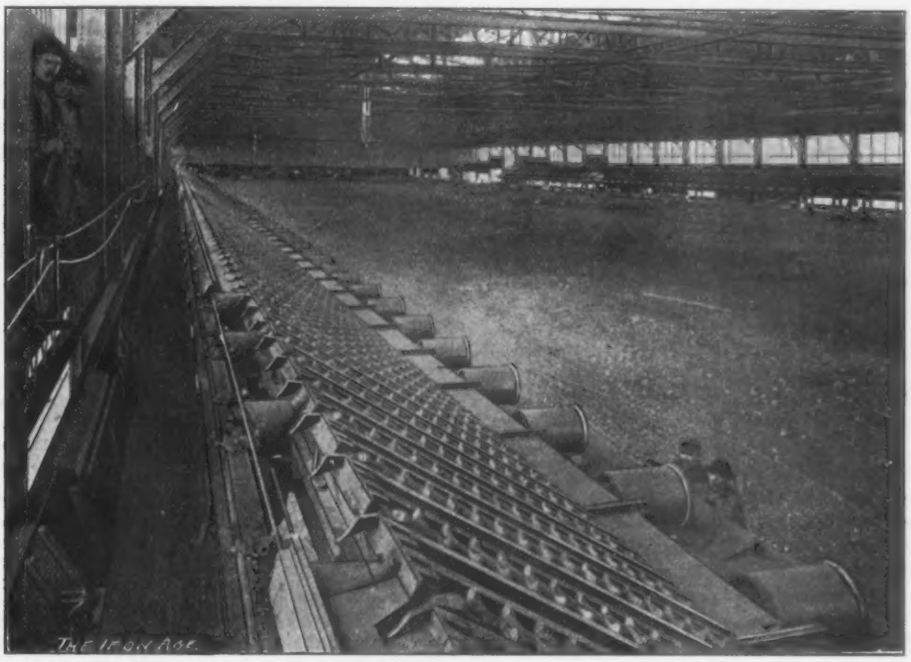


*Fig. 4.—Four Hundred and Fifty Foot Cooling Bed, Showing Details of Cone Roll Conveyors, Lifting Wings and Escapement Racks.*

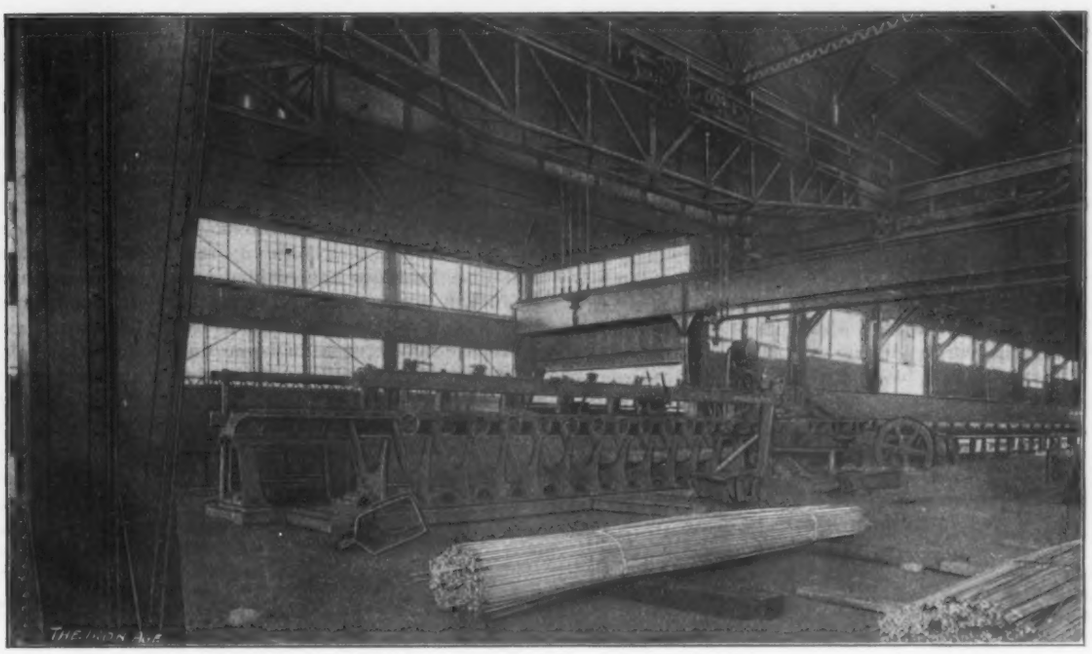


*Fig. 5.—Forty-Foot Gauge Bar and Shear, Showing Skeleton Scale, Pockets and Bundle Ready for Shipment.*

THE DUQUESNE MERCHANT BAR MILL.

bar in the meantime is slowly advancing on the points of the rolls. It naturally would work back to the large end, but is unable to get back over the shoulder. Thus one bar will overlap the other without interference.

After the bars are lifted on the inclined cooling bed they are allowed to work slowly down the slope. The lifting on of each bar lets all the other bars down one notch. The bottom bar slides down on the assembling table, where they are bunched by means of a rocking shaft carrying many levers, each with a push bar which slides out on each I-beam support. When a sufficient number have accumulated to warrant shearing they are all pushed clear on the live shear table and advanced to the shear, where they are all cropped and then cut to any desired length. The gauge bar, adjustable stop and back shear table are unusually complete. The severed bars are neatly pushed by means of a number of levers into a skeleton pocket mounted on a scale platform. After, say, 5 to 15 tons are cut they are weighed, and a couple of chains looped around them, by which they are lifted clear. After putting a couple of steel bands about the bundles they are ready to ship, as shown in Fig. 5.

## The German Iron and Steel Industry in 1902.

The past year has not been a satisfactory one for the German iron industry, the chief cause being the almost inexplicable decline of home consumption. The consumption of iron per capita in the German Empire, including Luxemburg, has been as follows, the basis of the consumption being the home production of pig iron plus imports of pig iron, manufactures and machinery, less exports of the same articles. Manufactures and machinery have been computed to the pig iron basis by adding 33 1-3 per cent.:

*Germany's Per Capita Iron Consumption.*

| Year. | Kilograms. | Year. | Kilograms. | Year. | Kilograms. | Year. | Kilograms. |
|---|---|---|---|---|---|---|---|
| 1880 | 39.3 | 1886 | 47.3 | 1892 | 74.3 | 1897 | 104.1 |
| 1881 | 39.4 | 1887 | 55.9 | 1893 | 72.5 | 1898 | 105.8 |
| 1882 | 51.5 | 1888 | 66.6 | 1894 | 73.9 | 1899 | 128.4 |
| 1883 | 51.2 | 1889 | 76.3 | 1895 | 71.9 | 1900 | 131.7 |
| 1884 | 57.0 | 1890 | 81.7 | 1896 | 90.1 | 1901 | 89.2 |
| 1885 | 56.7 | 1891 | 69.7 | | | | |

Taking as a basis the figures available for the first ten months of the year 1902, the home consumption of iron in Germany shows the alarming decline of 73.5 kg. per capita, in spite of the fact that the production of pig iron has increased somewhat over the year 1901 and very nearly reached the banner year, 1900. During the first ten months the production of pig iron of Germany was 6,917,737 tons in 1902, as compared with 6,516,986 tons during the corresponding period of the preceding year. The production was distributed as follows, in metric tons:

*German Production of Pig Iron in 1902, Ten Months.—Metric Tons.*

| | Tons. | Per cent. |
|---|---|---|
| Rhenish Westphalia, without Saar and without Siegen | 2,686,991 | = 38.84 |
| Siegen, Lahn and Hesse-Nassau | 447,632 | = 6.47 |
| Silesia | 564,965 | = 8.18 |
| Pomerania | 104,821 | = 1.52 |
| Hanover and Brunswick | 288,730 | = 4.17 |
| Bavaria, Würtemberg and Thüringia | 108,765 | = 1.56 |
| Saar District, Lorraine and Luxemburg | 2,715,833 | = 39.26 |
| Total | 6,917,737 | |

It is generally assumed, and a review of the past decade justifies this assumption, that the level now reached may be regarded as the lowest point, and that some increase in the consumption of iron in Germany is to be expected at an early date.

The success of the German iron industry, as shown in the above figures, in increasing its production of pig iron in spite of the depression at home is due solely to the fact that the works have fostered exports with all the means at their disposal. It was particularly important that the United States competed little or not at all in the neutral markets, but that, on the contrary, they appeared as purchasers of considerable quantities of German material. The imports and exports of iron and manufactures thereof, exclusive of machinery, were as follows during the ten months of the years enumerated

*German Imports and Exports, Ten Months.*

| | 1900. Tons. | 1901. Tons. | 1902. Tons. |
|---|---|---|---|
| Imports | 854,936 | 357,940 | 233,938 |
| Exports | 1,255,021 | 1,839,475 | 2,690,860 |

It will be observed that imports have declined 34.6 per cent. as compared with 1901 and 72.6 per cent. as compared with 1900. At the same time exports have shown the enormous increase of 46.3 per cent. as compared with 1901 and 114.4 per cent. as compared with 1900. As will be observed from the following table, the increase in exports has been notable in raw and semi-manufactured products, but is also recorded again in most of the finished lines:

*Exports of German Iron and Steel, Ten Months.—Metric Tons.*

| | 1900. | 1901. | 1902. |
|---|---|---|---|
| Scrap and old material | 42,007 | 100,894 | 148,673 |
| Pig iron | 103,990 | 113,119 | 270,108 |
| Beams, angles, &c | 183,621 | 289,294 | 326,062 |
| Steel sleepers | 30,833 | 27,557 | 34,932 |
| Steel rails | 123,331 | 142,029 | 276,422 |
| Bars | 136,253 | 262,085 | 302,113 |
| Ingots, blooms, billets, &c | 23,792 | 122,175 | 492,028 |
| Plates and sheets | 131,482 | 205,839 | 226,457 |
| Plates and sheets, galvanized | 6,174 | 6,549 | 8,315 |
| Tin plate | 223 | 138 | 132 |
| Wire rods and wire | 74,852 | 126,249 | 128,017 |
| Galvanized wire | 63,100 | 74,301 | 72,845 |
| Heavy iron castings | 26,017 | 23,570 | 26,710 |
| Bridges and parts thereof | 8,256 | 6,951 | 8,344 |
| Wire rope | 2,459 | 3,369 | 2,651 |
| Railway axles, tires, &c | 39,753 | 42,018 | 41,030 |
| Tubes (rolled) | 32,933 | 39,450 | 45,327 |
| Iron and steel forgings | 2,419 | 2,128 | 1,969 |
| Bolts and Screws | 2,077 | 2,987 | 3,755 |
| Enameled iron ware | 14,418 | 15,281 | 17,271 |
| Iron castings (fine) | 6,487 | 6,569 | 6,563 |
| Wrought iron ware | 14,104 | 15,588 | 15,979 |
| Sewing machines without frames | 4,839 | 4,871 | 4,902 |
| Bicycles | 1,422 | 1,596 | 2,074 |
| Cutlery | 4,455 | 5,169 | 5,184 |
| Typewriters | 20 | 31 | 48 |
| Needles | 993 | 923 | 1,065 |

The exports of rolling mill products, like beams, angles, bars, rails, sheets, wire and tubes, aggregated 1,425,270 tons, as compared with 1,179,329 tons in the first ten months of 1901.

The total export of iron manufactures and of machinery was 2,914,235 tons during the first ten months of 1902, as compared with 2,082,777 tons in the corresponding period of 1901.

As already indicated, the works found it necessary to make serious sacrifices in order to develop exports, and that business has yielded only very small profits. In fact, a larger part of the tonnage was coupled with losses, and was taken only to keep the works going. Since the net returns on home business were generally light also, there has been a very sharp reduction in the earnings of nearly all the works. The *Koelnische Zeitung* has compiled the following table showing the earnings and dividends of a series of large works:

*Financial Results of Leading German Iron Companies.*

| Companies. | Share capital. In 1000 marks. | Bonds. In 1000 marks. | Gross profits. In 1000 marks. 1900-1901. | 1901-1902. | Dividends. Per cent. 1900-1901. | 1901-1902. |
|---|---|---|---|---|---|---|
| Rhenish Westphalia: | | | | | | |
| Bochumer Verein | 25,200 | 2,283 | 6,345 | 3,684 | 13.33 | 7 |
| Hörder Verein | 27,028 | 9,800 | 5,877 | 2,048 | 10 | 0 |
| Rheinische Stahlwerke | 27,000 | 5,967 | 4,630 | 3,209 | 10 | 5 |
| Eisen-u. Stahlwerk | 15,000 | 7,727 | 4,049 | 2,646 | 10 | 0 |
| Union, Dortmund | 36,000 | 22,555 | 3,246 | 97 | 0 | 0 |
| Phœnix, Laar | 30,000 | .... | 3,844 | 3,149 | 4 | 0 |
| Aachen Hütten Act. Verein | 9,000 | 3,396 | 6,319 | 4,045 | 25 | 20 |
| Gutehoffnungshütte | 18,000 | .... | 7,953 | 7,490 | 20 | 20 |
| Upper Silesia: | | | | | | |
| Königs-u. Laurahütte | 27,000 | 12,055 | 8,831 | 6,345 | 14 | 10 |
| Huldschins Ry'sche Hüttenwerke | 20,000 | .... | 1,541 | 767 | 4 | 0 |
| Donnersmarckhütte | 10,039 | 7,301 | 3,505 | 3,899 | 16 | 14 |
| Bismarckhütte | 6,000 | 3,000 | 1,292 | 1,180 | 12 | 10 |
| Lorraine: | | | | | | |
| Rombacher Hüttenwerk | 20,000 | 16,000 | 3,384 | 3,173 | 10 | 5 |
| Aumetz-Friede | 20,800 | 13,203 | .... | 1,860 | 0 | 0 |

These works represent a tonnage equal to more than one-third of the entire pig iron production of Germany,

and yet their position has been relatively better, because nearly all of them possess their own collieries, a part of them their own ores, and all of them their own blast furnaces and steel works. The position was very much worse for those mills which are rolling mills exclusively, depending for their raw material upon the syndicates. Prices for this raw material kept fairly steady, and yet the product of these mills was not syndicated. As the unsatisfactory condition of the iron market developed the fact became more and more obvious that the entire development of the German iron industry is crowding in the direction of greater concentration. Thus works which consist of rolling mills alone have had the experience that they were the ones to receive the first blow during the reaction in the form of a sharp decline in prices of all their products. They could not equalize this decline by a corresponding reduction in costs, because the prices for coal, coke, pig iron and steel were maintained by the corresponding syndicates. The result has been the well-known disparity between prices of raw materials and prices of finished products, which has caused serious losses to many a rolling mill, but even an upward tendency in the iron markets would bring ample profits to the rolling mills pure and simple for only a correspondingly short time, because prices for the raw materials worked by them would at once tend upward and thus again reduce the spread between values to a minimum. In other words, the rolling mill, pure and simple, and the blast furnace having no control of raw materials seem truly to have very little opportunity for existence in the present development of the iron industry.

## Foundry Development in Great Britain.

Through the courtesy of W. C. Swift, East Orange, N. J., general agent for Europe of Henry E. Pridmore of Chicago, we have been favored with the following interesting statement relative to the foundry business of Great Britain, by J. W. Jackman & Co., London, who are reputed to be the leading foundry engineers of that country:

During the last few years great strides have taken place in Great Britain in foundry practice. This has arisen from two causes: 1. The greater knowledge obtained by foundrymen here of the cheapness of production arising from American methods, and which has led to many foundrymen paying special visits to America for the purpose of seeing for themselves the development of foundry practice there. 2. Through the way in which American foundry equipment has been actively pushed and thoroughly brought before the notice of foundrymen in this country.

Beyond these two causes the establishment of the new works of the British Westinghouse Electric & Mfg. Company in Old Trafford has been an object lesson not without value, because in these works, to which access is freely given, may be seen a foundry equipment on the very latest and best lines. Object lessons like these have not been without effect on the British foundryman, and he has at last awakened to the necessity of modern plant and modern methods. Among the American foundry equipment which may now be found in many foundries in Great Britain may be mentioned the Whiting cupola, which has easily maintained in this country its great reputation in America, and also the leading types of American molding machines. Among these the most prominent are the Pridmore, the Farwell and Tabor machines. The first type of machine, on account of the great range of sizes made, is adaptable to all classes of repetition work, from the smallest to the very largest, and machines of this kind may now be found in all the best equipped foundries in the Kingdom. The Farwell machine is largely used in the malleable iron trade in this country, especially in the Black country district, where most of the foundries of that class are to be found. There is now hardly a foundry of any standing which has not a complete equipment of these machines. The Tabor machine, on account of its higher first cost, greater complication and smaller adaptability, is not so much used here, but for certain classes of work it, too, has its advantages, and a number of these machines may be found among some of the large brass foundries.

American methods of handling molten iron, molds and castings are now largely adopted here. Whiting air hoists are frequently to be found, and various forms of trolley track or electric overhead cranes are made to suit the requirements of each particular shop.

The proper heating and ventilation of work shops is also receiving more consideration than of old. A few years ago it was a tradition that it paid best to keep the men cold, and that they would warm themselves by putting in harder work. Now it is generally recognized that for a man to work his best he must work in a comfortable and equable temperature, and the result of this change of opinion has been the installation of a number of very large heating and ventilating plants on the plenum system in up to date works in this country. It is not necessary to mention more than a few, but among those that have been installed the following installations made by the Buffalo Forge Company in conjunction with the writer's firm, will no doubt be interesting: The British Westinghouse Electric & Mfg. Company, Limited, Old Trafford, the largest installation in Europe; the British Thomson, Houston Company, Limited, Rugby; Armstrong, Whitworth & Co., Limited, Elswick; Vickers, Sons & Maxim, Limited, Barrow-in-Furness.

These four firms are only illustrations of many here which are well in the fore front of improvement, and there is no doubt that many American foundrymen would see foundry installations in these firms and of many other British firms of the same rank with much interest, and they would go back from their visit of inspection feeling that the Old Country was not so very far behindhand in adopting the best and most up to date foundry methods.

## The Pittsburgh Coal Company.

The Pittsburgh Coal Company of Pittsburgh are preparing to enter the coke business and will establish a large plant at once on the Redstone branch of the Monongahela Division of the Pennsylvania Railroad, in the Connellsville district. The Pennsylvania Mining Company, who are the real estate department of the Pittsburgh Coal Company, have purchased the plant and properties of the Colonial Coal & Coke Company, at Smock, in Fayette County, on the Redstone branch, from T. S. Lackey, president of the People's Bank & Trust Company of Uniontown, Pa., and other capitalists who were associated with Mr. Lackey in the Colonial Coal & Coke Company. The properties were purchased for a price approximating $300,000. The plant includes about 90 acres of coking coal, there having been at one time a considerably larger tract held by the Colonial Company, but this is all of the coal that now remains, the remainder having been made into coke. It also includes 240 acres of surface land and 130 coke ovens. The decision of the Pittsburgh Coal Company, whose business has heretofore been strictly that of mining and selling coal, to enter the coke trade was not without careful consideration. In view of the fact that the H. C. Frick Coke Company are now out of the general market and that coke prices as a result now range between $4 and $5 per ton, compared to $2.25 per ton on yearly contracts made this time a year ago, it is seen that the coke business is very profitable. The Pittsburgh Coal Company own a number of veins of excellent coking coal. Operations will be centered at Smock, where the plant will be increased to probably 500 ovens. The Pittsburgh Coal Company have owned, since they were formed, the Smock coal mines at that point, which have, however, been operated only at irregular intervals, owing to the fact that they are so far removed from the coal markets. In addition they own other large tracts of coking coal in the immediate vicinity.

The new "Maine," the large battle ship, which is one of the greatest fighting machines afloat, was put into commission December 29.

## The Development of Steel Plate Manufacture.

BY A. F. HUSTON, COATESVILLE, PA.

Year by year we are rapidly increasing the total output. Just two years ago this month Charles M. Schwab, in conversation with the writer, expressed his belief that in five years' time the consumption of steel plates in this country would be double what it then was, and if we judge by the progress made since then his prediction is likely to be fulfilled, although there will be less demand, apparently, for export work until some legislation is enacted more favorable to it than at present, both for steel plates in their unworked condition, and also in finished articles, such as steamships, &c. The passage of a ship subsidy bill, long a crying need in this country, would stimulate shipbuilding and thus make a very greatly increased demand for plates. It is indeed strange this one industry has been so much neglected in the legislation at Washington.

As to the increased uses for steel plates a great demand at present seems to come from the railroads, for bridges, locomotive boilers, tanks, cars, &c. The manufacture of steel cars using steel plates largely has jumped into great prominence within the past few months, one concern in Pittsburgh turning out upward of 100 steel cars every day, using somewhere from 1200 to 1500 tons of plates per day. Besides this company there are at least three others now manufacturing steel cars, but as they have only recently started into this manufacture, it will take some months for them to fully develop the business.

The steel plate industry seems to be the most active one in this country to-day, although only last summer structural shapes were the strongest. The introduction of the manufacture of basic open hearth steel has made a greatly increased demand for plates, this steel more closely approximating charcoal iron than any heretofore made, being tough and ductile, yet not being so stiff as steel made heretofore. This renders it less difficult to work into the various shapes required, while the fact that it is made from cast ingots gives it a homogeneous character, and thus makes it much superior to the old charcoal iron. I well remember the heart scalds and difficulties 30 years ago when I first went into this business which were experienced in trying to make perfect plates out of charcoal iron. First, the ore had to be pure, of course, in making charcoal pig iron. Then it had to be carefully smelted in a properly working furnace, the difficulties of which might be dwelt upon at length. Still let me take a good cold blast charcoal pig as a starter. That iron had to be melted in a runout fire and cast in chills. If this was not carefully and skillfully done the after results would be a failure. Then the iron was broken up and put into open forge fires with a single tuyere in each. It had to be carefully and regularly manipulated by the forgeman, in direct contact with the charcoal, and by the way, it was important to have good, clean charcoal. As the latter was made from wood piled on the open ground it was apt to get particles of gravel into it, notwithstanding all the care that might be exercised. These particles of gravel or dirt often were carried into the forge fire, were incorporated with the iron and made a defect in the bloom, which followed it through all its subsequent treatments and so was bound to make a defective plate in the end. But if good and suitable charcoal was used the quantity and character of the blast, together with the skill of the forgeman, were just as requisite to the production of good results. The loop had to be drawn from the fire at the proper time and with a proper heat, and hammered under a tilt hammer. This required great skill again, for if the loop was not promptly and properly hammered it was impossible afterward to get good results. Finally when the bloom or slab was made it had to be heated carefully in a reverberatory furnace in the best of condition and by a skillful heater, to prepare it for rolling into tops and bottoms, usually about 16 inches wide and 1 inch thick, being cut into lengths of usually 2 to 4 feet. Two of these were taken in order to pile between the shearings or in some cases bars. These piles were then charged into reverberatory furnaces and heated with the greatest care, in order to get a perfect weld, so that when rolled into finished plates there would be no blisters or defects of any kind. It was almost an impossible task to make every stage of this process complete and satisfactory, so that the senior member of our largest locomotive works told the writer some years ago that the poorest steel they ever put into locomotive fire boxes gave them less trouble than iron.

We went into the manufacture of steel plates something over 20 years ago, and to-day make no iron plates whatever. Iron is used to some extent to-day, but only as a specialty for plates. The demand is for larger and heavier plates all the time.

## Buffalo Celebrates the Completion of Its Outer Harbor Breakwater.

The Merchants' Exchange of Buffalo, N. Y., gave a banquet at the Hotel Iroquois in that city on Monday evening, December 23, to celebrate in a fitting manner the completion of the magnificent breakwater and harbor, which is now the largest of the kind in the world. The officers and members of the exchange and about 300 invited guests were present. The principal speaker of the evening was Congressman Theo. E. Burton of Cleveland, chairman of the River and Harbor Committee of the House of Representatives. Speaking to the toast "Our Commercial Future" he devoted a great deal of his discourse to Buffalo and its splendid harbor facilities. J. J. McWilliams, president of the exchange, acted as toastmaster, and toasts were responded to by Major Thomas W. Symons of the United States Engineer Corps, who has had supervision of the work on the harbor breakwater during its entire construction since its commencement in 1896; Hon. John Laughlin and Chas. W. Goodyear, president of the Buffalo & Susquehanna Railroad and of the Buffalo & Susquehanna Iron & Steel Company.

In his speech Major Symons said that Buffalo to-day has the largest artificial harbor in the world. Next in size is the harbor at Cherbourg, France. The breakwater there is 2000 feet shorter than the Buffalo breakwater. It required 70 years to build it, and cost $15,000,000. It required six years to complete the Buffalo breakwater and an expenditure of only $1,750,000. He said that a false impression prevailed that it is easier to build a breakwater in fresh than in salt water. A breakwater on the lake is subject to more wave action than any on the coast. Major Symons spoke favorably of Hughes Bros., the contractors who built the breakwater, and referred to the Lackawanna Steel Works as a direct result of the advantages realized by such a harbor. The total length of the breakwater is 25,411 feet, or 4.8 miles. The total harbor area protected by it is 1600 acres, of which 900 acres are over 18 feet deep.

During Congressman Burton's visit to Buffalo he stated that the River and Harbor Committee are favorably disposed toward the construction of the proposed ship canal on the New York side of the Niagara River, which it is proposed to build. This canal will be 250 to 500 feet in width, and will make the Niagara navigable for large ships as far as Tonawanda, extending through Tonawanda to within 2 miles of Niagara Falls. This canal would make Grand Island an immense shipping and manufacturing point, said Representative Burton, securing great manufacturing interests in this vicinity. The canal would be 16 miles in length, and would take in the Erie Canal; and its cost would probably be about $4,000,000. When the survey and estimate are finished the bill for the appropriation will be laid before Congress in the hope that it will be adopted.

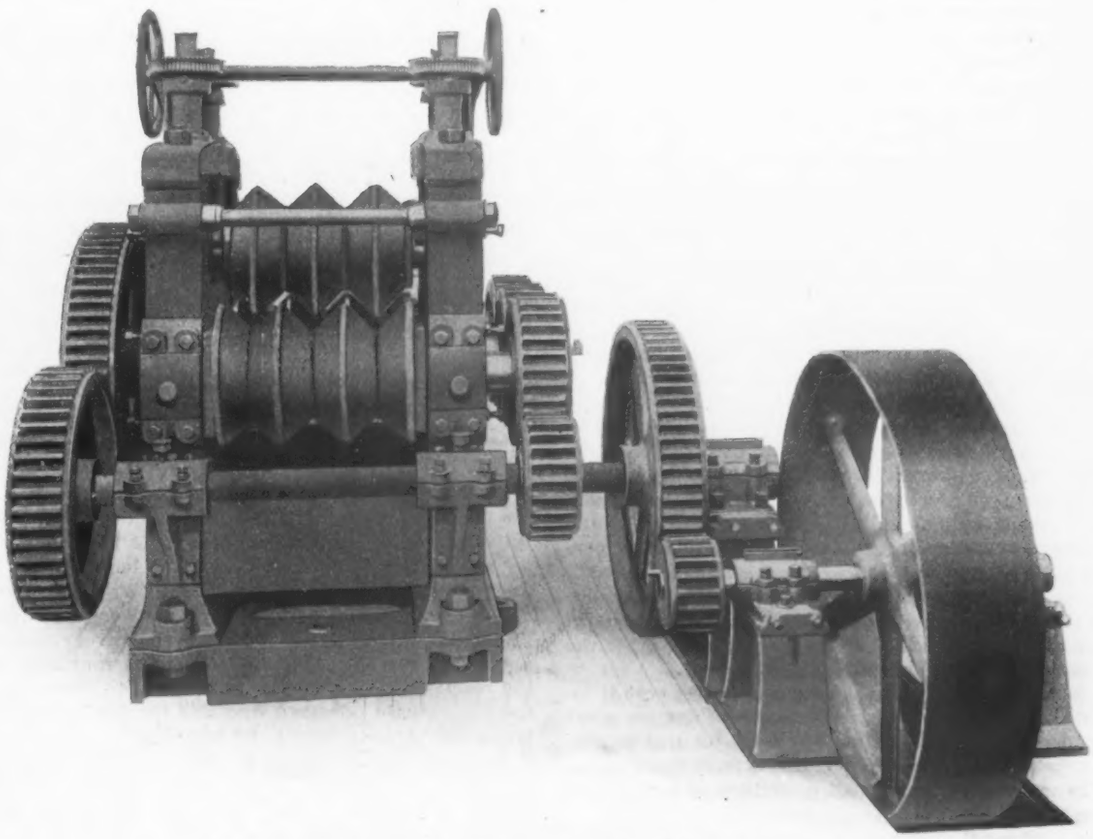
It is announced that the annual convention of the Southern Supply and Machinery Dealers' Association will be held in New Orleans from April 8 to 10, inclusive. The St. Charles Hotel has been selected as the headquarters. C. B. Carter, the secretary-treasurer of the association, whose headquarters are at 117 Gay street,

Knoxville, Tenn., adds the following statement to the official notification: "The growth and development of our organization has been very satisfactory; in fact, the interest and enthusiasm displayed by the Supply and machinery dealers and their manufacturing friends has been most remarkable, and the success of the organization is now assured. When it is considered that our organization is as yet less than one year old, we can well flatter ourselves as to the ultimate importance and efficiency of the organization."

## Straightening Rolls for Large Angles.

There is now in operation at the Milwaukee works of the Illinois Steel Company a machine for straightening large angles—6 x 6 inches, 5-16 to 1 inch thick. This machine was made and installed recently by the Brodesser Elevator Mfg. Company of Milwaukee, Wis., following the satisfactory service of three smaller machines for straightening 1 to 4 inch angles. The straightener is self contained, and is mounted on a heavy cast iron frame. The side frame is a solid web casting to receive the five chilled rolls—three lower and two top rolls. The rolls, which are compounded with steel gears and have a speed of 150 feet per minute, are 20 inches in diameter and arranged for three passes. The top rolls are adjusted by the movement of hand wheels, each roll being adjustable, by a wheel, parallel to its fellow. One of the prominent features of the machine is the side adjustment, accomplished by a set of screws, which are easily accessible. Another valuable point is that the rolls may be replaced by removing the caps of the bearings.

One important aim of the manufacturers has been to impart rigidity and solidity to the frame to insure the delivery of perfectly straight angles. At the same time the straightener has been designed to take up the least possible floor space. All bearings are easily lubricated. The machine may be adapted also for the straightening of bars of various sections. It may be either steam or electrically driven. The capacity of the large straightener shown in the illustration is 30 tons of heavy angles per hour. The total weight of the machine is approximately 17 tons.



THE BRODESSER STRAIGHTENING ROLLS FOR LARGE ANGLES.

## The Russian Sugar Bounty Case.

The Russian sugar bounty case, originating in Baltimore, was decided by the Supreme Court at Washington on January 5, the action of the customs authorities imposing an extra duty being sustained.

There is great complexity in the Russian system, said Justice Brown, but two facts stood out plainly: No sugar exported from Russia pays any tax whatever. Not a pound of sugar is permitted to be sold in the Russian Empire which does not pay at least the normal excise tax of about 2½ cents a pound. So that, whatever it may be called, said the Justice, it is clear that what is in effect a bounty is paid on sugar exported from Russia.

The litigation has occupied nearly two years. The imposition of the countervailing duty was levied by direction of Secretary Gage in February, 1901. The importation made by Robert E. Downs of Baltimore was assessed at the countervailing rates and was treated as a test case. Russian thereupon levied retaliatory duties on certain lines of American merchandise imported into the empire. At this juncture the National Association of Manufacturers engaged Ernest A. Bigelow to contest the validity of Secretary Gage's order.

The case was argued before the Board of Classification, and on April 19, 1901, an opinion was handed down written by Judge Somerville that Russia does bestow a bounty on sugar exported. The National Association of Manufacturers then appealed to the Federal Circuit Court at Baltimore. This tribunal, with the United States Circuit Court of Appeals at Richmond, Va., affirmed the Board of Classification's ruling. The case then went to the Supreme Court, where it was argued on October 29 last.

**Continuous Rolling Applied to Angles.**—In connection with the Morgan Merchant Mills, illustrated elsewhere in this issue, it may be of interest to note that

a similar pair of mills has recently been turned on to angles with gratifying success. The angles rolled are 3-inch and smaller by ⅛ to ⅝ inch in thickness. They are rolled in very long lengths, practically the full length of the beds, 300 and 350 feet, respectively, up to the present weight limit of 1500 pounds. The uniformity of section from end to end is remarkable.

## The Fan Blower and Its Application to the Cupola Furnace.*

As will naturally be anticipated, Nature's force of gravity was first called upon to supply the cupola furnace with air for combustion purposes. This means may possibly have been used only during an experimental stage. We find also that the steam jet has been employed for creating a vacuum in the stack, thus inducing the flow of a larger volume of air as well as the velocity of the air being increased. This device was, of course, very wasteful, and has been discarded entirely for producing draft in any case where the question of economy enters.

For a considerable period of time the blowing engine, as now used for Bessemer converters and blast furnaces, was used for blowing the cupola; but the cost of an engine to supply the required volume of air was very great, and its place was supplied by the so-called rotary blower, or positive pressure blower. This machine held undisputed sway until the development of the centrifugal fan. The fan blower of the type known as the pressure blower has practically replaced the other devices previously used, its introduction having been made about 30 years ago by B. F. Sturtevant, the pioneer centrifugal fan manufacturer of this country and of the world; for in no other country is this class of machinery produced which can compare with our own product.

It is true that the rotary blower is being used at the present time, but the records of the fan manufacturer and the conclusive testimony of the authorities upon foundry practice prove that its use is limited to a very small percentage of the whole; and even this small percentage would undoubtedly be overcome by a clear and accurate conception of the underlying principles controlling the movement of air by the centrifugal blower.

There are two general forms of fans for the movement of air: one is the propeller or disk wheel, discharging its air in lines parallel to its axis, and the other the peripheral discharge fan with inclosing case.

It may readily be seen that the disk wheel type is incapable of moving air at high pressures or against great resistances, and is, therefore, valueless for use in connection with the cupola furnace; however, it has a useful field in moving large or small quantities of air against atmospheric pressure.

The peripheral discharge fan is built as a volume or pressure blower, although one is simply a modification of the other. In either case the mechanism consists of a blast wheel of radial arms having floats fastened to the end of the arms, presenting their flat surfaces for the movement of air. The blast wheel is inclosed in a case or housing having an outlet so placed on the periphery that will give easy distribution of air, avoiding unnecessary bends in the piping. A blast wheel will move the maximum amount of air when it is not inclosed in a case. This fact is frequently made use of when it is desired to move large quantities of air against moderate pressures and where there is plenty of space for the construction of a large receiving chamber into which to discharge the air. Thus the function of the housing is that of a reservoir for collecting the air that it may be delivered at any desired point, and further to assist in maintaining the velocity of the air received from the rotation of the blast wheel.

The distinction to be made between a volume blower and a pressure blower is that the former is designed to move a large volume of air at a low pressure, and the latter is designed to move a relatively smaller quantity of air at higher pressure, which may be as high as 20 ounces per square inch. The points of difference in construction between a volume blower and a pressure blower having the same diameter of wheel are that the volume wheel will be wider and the pressure wheel will have bridging pieces spaced at short intervals on the periphery between the extremities of the blast wheel arms, their use being to prevent the air from rolling back upon itself at high speeds. A pressure wheel is as narrow as it can be made consistently, with a given diameter, on account of the requirements for which it is designed.

It must not be supposed that the pressure blower must be of heavier construction than a volume blower for the same diameter of wheel on account of the high pressures used. On the other hand, the volume machine may require more power to operate it on account of the larger volume of air moved, even though at a considerably lower pressure than the pressure machine is working. We find, therefore, in two machines of the same wheel diameter, one a volume, the other a pressure blower, that they are designed to transmit approximately the same power.

Turning to the forces acting when a fan is in operation, the air is delivered from the tips of the blades tangentially by centrifugal force, and naturally air enters the center of the wheel to replace that removed by centrifugal action. The rapidity with which these changes take place is, therefore, due to the speed of the fan. If the blast wheel is not incased in a housing the force of the peripheral flow is soon lost by reason of the fact that the particles lose their identity as air in motion by free expansion in the atmosphere. This demonstrates further that the use of the housing with its inlet and connecting piping is that of a reservoir in which a pressure is maintained by the action of the blast wheel.

This brings us to a consideration of the laws under which the forces produced by a fan in motion act. Stated briefly, the volume of air delivered by a given fan varies directly as the speed, the pressure as the square of the speed, and the power as the cube of the speed. That is to say, multiplying the speed by two multiplies the volume by two, the pressure by four and the power by eight. If these facts could only thoroughly be impressed endless trouble would be avoided. For instance, a fan is purchased, and the buyer is told that under certain conditions and running at a given speed the fan will require so many horse-power to operate it. The data in regard to horse-power is very carefully noted, but the statement as to speed is forgotten, with the result that an armature is burned out, perhaps, and the unfortunate salesman who sold the fan has his reputation for veracity very sadly impaired.

We have parallel cases in other kinds of machinery, especially in the case of the steam engine. A steam engine is frequently rated as a 50, 100 or 200 horse-power machine, when as a matter of fact it may be developing power at a considerable variation from its rated capacity due to differences in speed and steam pressure and to variable cut off in an automatic engine.

Referring again to the fan with its housing and system of distributing pipe as a reservoir, we have the case of any reservoir filled with a fluid, as air may be considered a fluid for the purpose of discussion. All fluids have their own peculiar properties: so has air different properties than water, for instance.

A cubic foot of water at 62 degrees F. weighs 62.5 pounds, while a cubic foot of air at this temperature weighs 0.0778 pound. Dividing one weight by the other, water is 803 times as heavy as air. A cubic foot of water resting upon a square foot of surface, or 144 square inches, exerts a pressure of 0.432 pound per square inch, and in order to have a pressure of 1 pound per square inch there must be a hight of 2.3 feet (by dividing 1 pound by 0.432 pound, the pressure obtained by the hight of 1 foot). Now since water is 803 times as heavy as air, the latter will require $2.3 \times 803 = 1846$ feet of hight or head to obtain 1 pound of pressure with air. In the case of water, of course, the real head may exist, but in the case of air the assumptions as to head are ideal; but by the employment of the assumptions it may be stated that the 1 pound pressure per square

* A paper read by R. B. Hayward, Pittsburgh representative of the B. F. Sturtevant Company, Boston, Mass., before the Pittsburgh Foundrymen's Association, on Monday evening, January 5, 1903.

inch would be the result of a cubic inch of either substance falling freely through their respective hights, as determined above.

Although these two freely falling bodies may exert the same pressure at the end of their respective falls the velocity of air will be much higher; determined by the use of the formulæ for falling bodies, which is

$$V = \sqrt{2\,g\,h},$$

in which $V$ = velocity in feet per second; $g$ = acceleration due to gravity = 32.2, and $h$ = head in feet.

Substituting in this formula we have water at 13 feet per second velocity, giving 1 pound pressure, and air at 545 feet per second, giving 1 pound pressure. In this calculation air has been taken at 62 degrees F., whereas by increasing or lowering the temperature the velocity required for a pressure of 1 pound per square inch will be correspondingly increased or decreased owing to the change in density of air at varying temperatures. It is seen, therefore, that air at a given pressure escapes at a much higher velocity than water at the same pressure, due to the difference in density, but, on the other hand, the velocity is dependent upon the distance fallen, represented by the head—that is, two bodies of equal dimensions will fall at the same rate of speed, demonstrated by the old experiment of dropping a wooden ball and an iron ball of the same diameter simultaneously, when it will be found that the two balls will reach the ground at the same time.

The method of determining the velocity due to any given pressure has thus been explained, and by use of the same formula the pressure due to any velocity may be obtained in connection with the weights of air at different temperatures. This demonstrates that for the purpose of moving air it is the function of the blast wheel to create the velocity or pressure in the reservoir.

From the discussion of the formula employed in fan design it may be seen that the pressure will vary as the square of the speed. The volume, of course, will increase directly as the peripheral travel of the fan, or directly as the number of revolutions.

The work delivered by a fan is represented by the distance traveled by the effective area of the blast wheel and by the pressure or head against which the effective area acts. This gives a product in foot pounds which with the efficiency of the machine determines the actual amount of power necessary to drive the fan under the given conditions.

In operating fans it is necessary, therefore, to bear in mind the question of power required, and fans should be selected to give the maximum amount of air required at the lowest possible pressure to carry it to its destination; for we not only save in power at the low pressures, but, generally speaking, the efficiencies of fans at low pressures are much higher than at high pressures. Even if a fan is installed and some time later more duty is thrown upon it, it is far more economical to buy another fan of equal or one of double capacity, and in the latter case to stock the old fan, than to speed up the machine, which would multiply the power by eight instead of two and which would soon eat up not only the interest on the cost of a new fan, but the entire cost itself.

It may seem unimportant to lay so much stress upon the matters of pressure and power, but it is readily excusable when one has observed practical engineers deliberately selecting fans with the idea that when future extensions are made the fans shall be forced up to high pressures to do the work.

In designing a wheel to deliver a given number of cubic feet per minute at a certain pressure the first step is to determine the diameter from the revolutions per minute, indicated by whatever can be best obtained from the driving mechanism. Having determined the diameter, sufficient width is taken to deliver the volume. If, however, the width determined is too great in proportion to the diameter, the wheel is impracticable owing to the fact that it is impossible to give sufficient inlet area at either side of the wheel for the passage of the amount of air that the wheel is required to deliver.

Such a problem may be encountered in the design of fans for air blast transformers in large power stations. It is usually desired to run the fans with direct connected induction motors, which are subject to limited variations of speed. A specified amount of air is required at a certain velocity, which is likely to be low; the motor speeds are likely to be high, compelling a small diameter of blast wheel to keep the pressure down. This increases the width beyond what is practicable. The electrical engineer is then called upon to alter the motor as much as possible, to lower the speed, which gives the fan a little more respectability, and finally something is designed that will do the work required of it, but which would not pass very far as a thing of beauty from an engineering point of view.

In the case of the cupola, or pressure, blower the requirements are to deliver a comparatively small quantity of air against the resistance represented by the stock in the cupola, requiring therefore a comparatively high pressure. Consequently the wheel is of large diameter to obtain the required pressure with as low speed as possible and proper width to give the volume.

Many users of fans are under the impression that the velocity of air in the discharge pipe will be increased by closing off the area with a blast gate, thinking that the same volume of air passing through a smaller area must necessarily have a higher velocity. The same volume of air is never obtained, and to a limited extent only will the velocity increase. The expressions "within the capacity of the fan" and "effective area" have been used in previous discussions. It has been proved experimentally that a centrifugal fan inclosed in a housing has the ability, when driven at a certain speed, to maintain the pressure corresponding to its peripheral velocity over an effective area, which is usually termed "the square inches of blast." This area is a critical point. If the fan be provided with an outlet smaller in area than the square inches of blast the velocity will not be increased, even if such area be only a small percentage of the square inches of blast. If the area of outlet be larger than the square inches of blast the velocity of air passing through the outlet will be lower than the peripheral velocity.

As a rule fans are constructed with an outlet whose area is considerably greater than the square inches of blast, so that when making tests it is necessary to provide a specially constructed temporary orifice of area equal to the square inches of blast. The flow of air is thus restricted, which condition is approached in ordinary practice by means of the friction and resistance of piping.

The effective area, or square inches of blast, for various sizes of fans is a matter of experiment, and has been very carefully determined by the Sturtevant Company with various proportions of machines; these values are subject to variation and must be used with judgment and discretion. However, an approximate measure of this area for a given wheel is one-third of the area obtained by the product of the diameter and width of wheel, or by employing a formula:

$$\text{Square inches of blast} = \frac{D\ W}{X}$$

in which $D$ = diameter in inches, $W$ = width in inches at the periphery and $X$ = constant.

The value of this constant, as stated above, may be assumed as three for ordinary calculations; although much depends upon the type of fan and design of casing.

It is important that the area represented by the effective area, capacity, or square inches of blast, as it may be called, should not be confused with the area of the outlet, which is always greater than the capacity area. The volume of air delivered through the standard outlet is always greater than the volume delivered through an outlet equal in area to the capacity area, although the pressure is lower. This fact may be realized by referring to the statement that a wheel will deliver its maximum volume when operating without any casing whatever. There are good and sufficient reasons for making a standard outlet larger than the capacity area; for at low pressures when the efficiency is not subject to rapid changes a larger volume may be obtained with the same fan; and at higher pressures the

system of piping carried out on the basis of the outlet area will tend to present a resistance to the flow of the air equivalent to the cutting down of the outlet to its capacity area; and the same conditions are approached in a system of piping as is presented in operating the fan on a short outlet equal to the capacity area.

Briefly stated, it is the province of the cupola blower to furnish a volume of air necessary to the proper combustion of the fuel required to run a given heat; the required volume of air being at such a pressure as to insure its passage into the cupola against the resistance to its flow.

The various authorities upon foundry practice state the amount of air required for the melting of a ton of metal, so that with a given cupola capacity a fan having a capacity fully equal to the maximum amount of air that may ever be required should be selected; as it is always economical to have a larger fan than may be actually required to do the work. By having a fan that is sufficiently large the condition is more likely to be present of the fan delivering air among the fuel and iron through a total free area that is equal to or less than the square inches of blast of the fan; considering also the fact that the resistances of piping, wind box and tuyeres also do their share toward cutting down the effective area of the fan. This is the condition that should be approached, previously shown to be necessary for best results.

In regard to the pressures at which air should be delivered to a cupola, the authorities on foundry practice seem to agree more or less closely upon this point, as well as the great majority of foundrymen, the range being from 4 to 14 and 16 ounces, depending upon the size of the cupola, and may we say the skill or methods used in charging the cupola, although it is the province of this discussion to deal only with the movement of air as touching foundry practice.

The point at which the pressure is usually measured is, of course, in the wind box; at least the knowledge of what the pressure is at this point is of more value to the melter than what may be indicated at the fan; for owing to the losses due to transmission there is always a drop in pressure at a given distance from the fan. By a proper proportioning of piping this loss may be limited to the fraction of an ounce, so that to obtain a desired pressure in the wind box it is necessary, with properly designed piping, to speed the fan to a pressure of approximately ½ ounce in excess of the desired pressure in the wind box. By reference to the Sturtevant catalogue No. 99, in regard to steel pressure blowers, there will be found tables giving information upon the proportioning of piping to accomplish the above results. There are also very strong injunctions as to the avoiding of sharp bends, and wherever it is necessary to change the direction of flow it should be made with as large a radius as possible.

At an early point in this paper it was stated that the power required to operate a given fan varied as the cube of the speed, but on the other hand, the power required to operate a given fan at a constant speed is proportional to the area of the outlet. This is in line with the statement that a blast wheel delivers its maximum volume when not inclosed. If then the area of the outlet is reduced to nothing by closing the blast gate the power required to drive will be reduced to a friction load. The advantage of closing down the blast gate during the latter part of the heat when less volume is required, thereby saving power, is obvious. In this way the blast is under control of the melter at all times. In contrast with the positive pressure blower, so-called, the fan blower is automatic in its action. Instead of always delivering a fixed volume regardless of requirements the fan blower automatically increases the volume as the resistances decrease, and when a fan is working on an area in excess of its capacity and should the resistances increase the pressure will increase to overcome such a resistance.

A pressure gauge ought always to be used on a cupola and the melter should thoroughly understand its use, it being necessary that the tubes conveying the pressure to the water or mercury in the glass be so arranged that they will show the true conditions inside the blast pipe. To properly register the true pressure the connecting tube should enter the blast pipe and turn at right angles to its length, so that the air in the tube, which transmits the pressure to the mercury in the glass, will feel the full force of the air leaving the wheel at the velocity of the fan tips. If the tube enters the blast pipe at right angles to the flow of air and a fan is working on more than its capacity area the glass will show no difference in pressure, owing to the fact that the air simply sweeps by the end of the tube and imparts no force to the column of air within the tube. However, close off the fan outlet and there will be a showing on the business end of the glass with the fan running at the same speed. This is true, because fluid pressure is transmitted equally in all directions, and as air is a fluid, the pressure caused by a resistance to flow naturally backs into the gauge glass tube and is transmitted to the liquid in the glass. Consequently, with improper arrangement the melter may think that the fan is doing no work whatever, while the belts are slipping and smoking, showing that the power is being consumed; there may be the desire to throw the fan through the charging door, when the simple truth of the matter is that the fan is too small. One other point in this connection is that there always exists a potential pressure equal to the velocity of the fan tips, notwithstanding that there may be no flow of air, as when the outlet is closed, and that the power consumed is at a minimum.

Aside from the decided advantages in operation, which we have endeavored to make clear, the fan has other advantages over the rotary blower. It weighs far less, consequently costs less, requires no expensive foundations and is less subject to repairs. To take a practical example, a case may be cited which occurred during the past few months where three positive pressure blowers were used on one system of piping for blowing three large cupolas, each 9 feet in diameter inside of lining. Satisfactory results were not obtained and the blowers were replaced with three Sturtevant pressure blowers connected to the same system of piping, with the result that the melting capacity was doubled with far less power, and one of the positive blowers was sold at practically what the three Sturtevant fans cost.

The considerations that have been presented have dealt particularly with the fan applied to the cupola, and it is hoped that some facts have been made sufficiently clear to be of value. The fan is used for many other purposes, with the field for its use rapidly increasing. Manufacturers are recognizing this and are everywhere availing themselves of the advantage of its merits and peculiar adaptability to various lines of work.

## The Drawback on Steam Pumps.

The Treasury Department has rendered the following decision:

On the exportation of steam pumps manufactured by the International Steam Pump Company of New York City, in the manufacture of which are used in stated fixed proportions pig iron imported as such, "sprues" containing at least 40 per cent. of such iron, and domestic pig iron, a drawback will be allowed equal in amount to the duty paid on the imported material so used, less the legal deduction of 1 per cent.

The preliminary entry must show separately the marks and numbers of the shipping packages and the contents of the same, described, when practicable, by kind, size and designation, as described in the manufacturer's illustrated catalogue, a copy of which shall be filed for the information of the collector's office. Each package shall be marked to show the commercial designation of the pump contained therein, and in case a number of packages are required for the shipment of a single pump, such packages will be so marked as to enable the inspecting officer readily to identify them as containing parts belonging together. Each package will be marked to show its gross, tare and net weight, which also shall be shown in the preliminary entry.

The drawback entry must show the total number of

pumps of each size and description exported, the net weight of each pump and of the rough castings used in the manufacture of the same, together with the percentage and quantity of imported pig iron consumed in the manufacture and claimed as the basis for allowance of drawback. The said entry must further show, in addition to the usual averments, that the kinds and proportions of materials used were as set forth in the manufacturer's sworn statement, dated November 22, 1902.

The manufacturing record must show the date and number of the melt or melts represented wholly or in part by the exported castings, the percentages and quantities of the materials used in each melt, and the weight and manufacturing order number of castings in the rough on which drawback of duties is claimed. As a prerequisite of liquidation a sworn abstract from such record shall be filed, the oath to which shall set forth that it is a correct transcript from the record and that the facts therein stated are just and true.

In liquidation the quantity of imported pig iron which may be taken as the basis for allowance of drawback may equal the quantity consumed as declared in the drawback entry, but in no case shall it exceed 52 per cent. of the weight of the castings in the rough, officially verified, as ordered by the collector.

## The Machinery Market on the Rand.

In a series of articles on South Africa a special commissioner of the London *Engineer* reviews as follows the position of different countries in the Rand machinery market: "On the Rand it would appear that England has practically the whole of the trade in boilers, and these are nearly all of the multitubular and water tube types. We do also nearly all the skips and stamp mills, and tool steel, and at least our share of the winding gear. The Germans latterly have been cutting into our trade with trucks of a very cheap class, but it is anticipated that this is only a temporary loss, as the German trucks do not give satisfaction, and the life of a mining truck is of far more importance than its first cost. In rails England shares the market about equally with the Continent. In the larger pumps America is coming to the front, doing probably three-fifths of the total, while we do the balance. We have, however, recently taken over nearly the whole of the market in boiler feed pumps and air pumps. In compressors, steam and other engines, pipes and belting, England and America divide the market about equally. In wire ropes and machine tools we still have rather more than half the total. Germany, however, is cutting into the American machine tool trade by cheap and inferior, though very faithful, copies of the American tools. She is also encroaching on our market for shoes and dies, our price being from 23 to 26 shillings per 100 pounds, and hers 19 shillings for a fairly good article. America has quite captured the market in conveyors and oils. In rock drills she is ahead of us. Belgium does nearly all of the cyanide tanks and accessories. In electrical plant our position is a very critical one. I believe we do from 35 to 40 per cent. of the total, as far as the actual machinery is concerned, if we include the steam engines for generating the power. In switchboards, lamps and other accessories we are entirely out of the market, owing to the fact that our Continental competitors make an equally good thing for, in some cases, only half the money. To revert to the question of electrical machinery—*i.e.*, motors and dynamos—we have been steadily losing ground in these to Germany and the United States. And the reason for this is that our older and better known manufacturers have failed to keep pace with the times. Every effort has been made by the local merchants here to continue to do business in their machinery, but their prices are altogether too high, and their machines are said to be no better, and their range much more limited than those turned out by our foreign competitors. Switzerland and Germany have cut us out in electrical accessories; Switzerland, Germany and the United States are cutting us out in electrical machinery. With regard to this last item, however, there appears to be one hopeful sign. There is, I am told, a younger set of manufacturers of electrical plant springing up in England—a new school, if one may use the expression. These firms, who have started with new plant and new ideas, have been able to profit by the object lessons set by our foreign competitors, which the older firms have not always troubled to follow. The result is that British made machines, in every way equal to those made elsewhere, and at prices which will enable them to compete in the open market, are beginning to find their way to this country. There are many people here who hope that these firms may save the situation for British electrical plant. It is to be hoped, too, that when our older firms have grasped this fact they will follow suit, and aid in the re-establishing of a trade in a class of machinery which has been steadily slipping out of our hands."

## The Wright & Colton Wire Cloth Company's Improvements.

The Wright & Colton Wire Cloth Company, Worcester, Mass., are establishing a department for the manufacture of wire rope, which will be located at the company's plant at Palmer. James B. Stone, for many years the superintendent of the wire rope department of the Washburn & Moen Works, at Worcester, has resigned to become the superintendent of Wright & Colton's new department, and Alfred Waites, former general sales agent of the Washburn & Moen Mfg. Company and later in the sales department of the Washburn & Moen department of the American Steel & Wire Company, will be the sales manager for the new rope business. All kinds of wire rope will be manufactured from the smallest sash cord, three thirty-seconds of an inch in diameter, to 2½-inch rope. The product will include elevator, transmission and street railway cable, dredge and derrick cable and ships' rigging and hoisting rope. Both steel and iron rope will be manufactured.

An extension has been built to one of the Wright & Colton Company's buildings at Palmer, making it a modern mill building, 60 x 180 feet, two stories high, with full basement. Everything about this structure is up to date, including a complete electric plant. A separate spur track has been put in by the Boston & Albany Railroad for the particular use of the wire rope department, which will occupy all of the building. At present power will be received from the company's big engine, but it is planned to install a separate engine for this department.

The company have a complete wire mill at Palmer, although the main plant is at Worcester. There was no available land at Worcester, otherwise the new department would have been located there. Special furnaces will be installed at Palmer to produce high grade crucible steel rope wire. Only four other concerns have facilities for the manufacture of high grade rope wire. They are the American Steel & Wire Company, at San Francisco and Worcester; the John A. Roebling's Sons Company, and Trenton Iron Company of Trenton, N. J., and the Hazard Mfg. Company of Wilkes-Barre, Pa.

The new rope machines, or, more technically, the rope laying machines, are being built at the Wright & Colton machine shops, under the direction of J. B. Stone. There will be at least six types of these machines, and four are already approaching completion, including one monster which will carry 10 tons of wire on its reel. The spooling machinery is contracted for outside, to save time. Work is being rushed, and it is expected that the department will be doing business early in the year.

J. B. Stone is one of the veterans of the wire rope business. He went to Washburn & Moen's from St. Louis years ago, large inducements being offered him because of a reputation already acquired in the designing of wire rope machinery. Alfred Waites is another Washburn & Moen veteran, having been connected with the office force for 30 years, a part of the time as general sales agent, with wire rope as his own particular department of the sales.

The Wright & Colton Company will occupy a portion of the room vacated by the sale of their wood screw de-

partment for an extension of their wire cloth business, new looms for which will soon be in operation.

## Should Analysis Be Included in Steel Specifications?

Herr Knaudt has an article in *Stahl und Eisen* on the above subject, from which we extract the following:

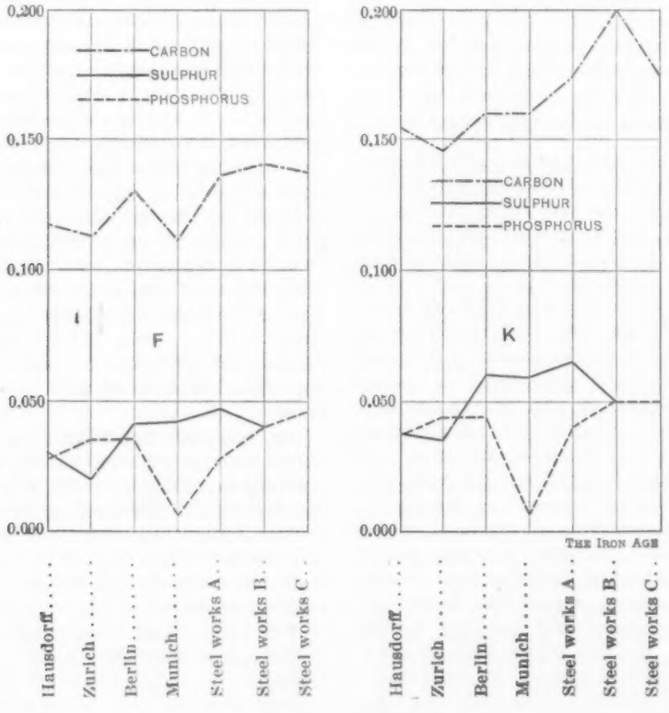
In Germany specifications call for tensile, bending and drop tests, but of late for foreign shipments the chemical composition has, in many cases, also been specified. Hitherto, when this question has been brought up manufacturers have taken the stand that analyses for various reasons could not be used, but there has always been a respectable minority desiring to use them, so that in all probability the question will be brought up again before long, when America will be cited as an example. Among the various reasons brought forward against their use is the assertion (strongly contested by the opposition) that the present status of chemical science is not high enough to insure that work carried out in different laboratories shall agree. To prove this, Professor Bach recently published analyses from three laboratories on five different materials, the result of which shows that chemists are still a long way from working with such certainty that the results of their labors are beyond dispute. The three laboratories, being all of an official character, do much work besides analyses of iron and steel, and the thought naturally arises that steel works laboratories, who do nothing else, would give more reliable results in this line than those from public institutions, polytechnics, &c. To determine the truth of this supposition, the Schultz-Knaudt Plate Mill Company of Essen proceeded as follows:

From a slab ingot 11¾ x 15¾ inches in area and 21½ inches long, weighing 705 pounds, was rolled a plate 31½ x 63 x 25-32 inches, weighing 485 pounds. From each end of this transverse test pieces were cut about 2⅜ inches wide, which were designated F and K. Tensile tests cut close by gave an ultimate strength of 54,300 and 59,000 pounds, with an elongation of 30 and 26 per cent., respectively.

From F and K borings were made, packed in small boxes and sealed by Dr. Hausdorff, a chemist of Essen. One set of tests was investigated by Dr. Hausdorff himself, three more were sent to the official laboratories of Zurich, Berlin and Munich, and three others were sent to three of the largest steel works, which will be designated as A B and C. Each of the laboratories determined the carbon, sulphur and phosphorus in each sample. The results are shown in the following table and diagrams:

| | Carbon. Per cent. | | Sulphur. Per cent. | | Phosphorus. Per cent. | |
|---|---|---|---|---|---|---|
| Analysis made by | F. | K. | F. | K. | F. | K. |
| Dr. Hausdorff of Essen | 0.117 | 0.154 | 0.030 | 0.037 | 0.028 | 0.037 |
| Swiss Polytechnic, Zurich | 0.112 | 0.146 | 0.020 | 0.035 | 0.035 | 0.044 |
| Royal Testing Laboratory, Berlin | 0.13 | 0.16 | 0.04 | 0.06 | 0.035 | 0.044 |
| Royal Technical High School, Munich | 0.11 | 0.16 | 0.041 | 0.059 | Trace | Trace |
| Steel works A | 0.136 | 0.174 | 0.046 | 0.066 | 0.028 | 0.040 |
| Steel works B | 0.14 | 0.20 | 0.04 | 0.05 | 0.04 | 0.05 |
| Steel works C | 0.137 | 0.175 | .... | .... | 0.045 | 0.05 |

A glance shows that the results do not by any means agree with each other. Leaving out of consideration the sulphur determinations of Munich and those for carbon made at steel works B, the lines of the diagram are nearly parallel. If they were entirely so it would show that the various laboratories worked relatively correctly, in spite of the fact that their absolute values differed. That circumstance also accounts for the fact that manufacturing may be successfully controlled by analyses which are incorrect, because the results are available for comparison. It is also manifest that the work of public laboratories is in no way behind that of the steel works. It can therefore be stated with certainty that the present position of chemical science in Germany is not such that its results can be used in the steel trade to justify the acceptance or rejection of material, and that if the question of specifications should be raised again the analysis should not be incorporated until these conditions are improved. That an attempt is being made in this direction is proven by the existence of a commission appointed by the Verein deutcher Eisenhuettenleute, which is to report upon the introduction of standard methods of analysis.




*Chemical Analyses Plotted.*

In the light of the fact that in America chemical analysis has been used for some time for the purpose in question, only two conclusions can be drawn; either American chemists are ahead of their German colleagues, or in the inspection of material the specifications are not so conscientiously adhered to as is fortunately the case in Germany. The reader can take his choice.

On the above remarks, *Stahl und Eisen* comments editorially by saying that they agree that the analyses

given will cause no astonishment in practical circles, and they mention numerous other cases in which similar discrepancies have been brought to light. They maintain, however, that the position of chemical science in Germany is so incontestably high that its representatives need not defend themselves against the reproach contained in Herr Knaudt's remarks. Further, that there can be no doubt that metallurgical chemists have made such progress that the limits of error of certain methods can be kept very narrow. The practical use of these methods is, however, hampered by sundry difficulties, such as lack of uniformity in the material and the impossibility of obtaining samples which are above suspicion.

They agree with the view of Mr. Knaudt that chemical analyses should not be used in the inspection of rolling mill products for the reason that the primary object of such inspection should be to ascertain if the material possesses those properties which are necessary for its intended use. Among such properties, however, chemical analysis finds no place.

In the following number of *Stahl und Eisen* Professor Martens disputes Herr Knaudt's assertion that the present status of chemical science is not sufficiently high to justify the use of analyses in the inspection of iron and steel products. His reasons for this are, firstly, want of proof that the test material was obtained as it should have been, and, secondly, that the whole method of procedure was unconvincing and incomplete. He thinks that in order to find out how far various laboratories agree, the most important thing is to ascertain how near they come to similar results in repeated tests made at different times on a test material free from all suspicion. He suggests that representatives of various interests should collect really representative samples of several kinds of iron and send them in sealed and numbered packages to various laboratories at different times in such a way that each institution analyzes each material at least three times without knowing it. By doing this sufficient data should be accumulated to enable one to judge fairly as to the accuracy of the work turned out by different institutions.

Herr Knaudt replies to these criticisms by firstly letting Dr. Hausdorff, in whose presence the samples were obtained, describe minutely his methods, remarking that undoubtedly much more care was used that would ordinarily be the case. Further, that the method suggested by Professor Martens is not calculated to clear up the question as to whether analysis should be used or not, whereas his (Knaudt's) procedure showed that the results from different laboratories on the same material differed too much to allow the use of analysis in buying material. His article showed his belief that these divergences were due to varying methods of analysis, and he even remarked that the results were relatively correct and therefore useful, although the absolute values were incorrect. He contends that the professor's suggested procedure would simply show how correctly the same operators work the same methods, conditions which are impossible in practice.

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A notable event the past week was the transmission of the first message by cable between the Hawaiian Islands and the main land. It was sent from Honolulu to San Francisco on the evening of New Year's Day, within an hour after the completion of the landing of the cable. The difference in time between the two cities is 2 hours and 22 minutes, and the distance is 2089 miles. This is the first section of the submarine cable of the Commercial Cable Company which will shortly connect the United States with the Philippine Islands and the continent of Asia. Honolulu is 4917 miles from Hong Kong, China.

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The Cataract Auxiliary Company of Hamilton, Ontario, have been granted a charter by the Province of Ontario for the purpose of manufacturing, selling and dealing in electric power. The capital is $1,000,000. The provisional directors are Hon. J. M. Gibson, James Dixon, J. R. Moodie, W. C. Hawkins and J. W. Sutherland. The company are an allied interest of the Cataract Power Company, whose plant is located at De Cew Falls, near St. Catharines, Ontario. It is intimated, but not officially, that the Hamilton company have been organized for the purpose of protecting the Cataract Company's interests in transmission in and about Hamilton, for the big companies who are developing power at Canadian Niagara talk of extending their transmission lines to Toronto via Hamilton.

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## The Microscope in Crucible Steel Manufacture.

BY JAMES J. MAHON, PITTSBURGH, PA.

The technical journals in the past few years have devoted considerable space to the microscope and its relative value in the manufacture of fine steel. Practically all the experiments made and illustrations shown indicate that the microscopic examinations have been made after the steel has been subjected to some form of treatment. The writer's opinion is that the microscope, in order to be of any practical assistance to the manufacturer of fine steel, should be used on the ingot immediately after it is cast. The manufacturer of good crucible steel must in the first place use the best of materials, principally good iron. Good steel cannot be made from poor iron, even with the assistance of the microscope. As soon as the ingot is cast, it is then either good steel or bad steel, and its qualities should be determined right then and there. If the ingot shows that the refining process has been incomplete and consequently the elements not properly combined, there is only one treatment which the ingot should undergo and that is to cut it up and melt it over again. While we hear and read a great deal of the results of different forms of heat treatment, we must still bear in mind that while good steel can be spoiled by bad treatment, bad steel cannot be converted into good steel by any kind of treatment except by remelting it. Consequently the time to determine the quality of the steel is immediately after it is cast. The microscope has demonstrated one fact, and that is that it is impossible to determine whether an ingot has been properly melted by an examination of the fracture with the naked eye. The most essential thing in connection with the manufacture of high grade crucible steel is the amount and quality of iron which the mixture contains. The quality of the iron cannot be determined by chemical analysis alone, as some makes of iron, although very low in both phosphorus and sulphur, do not make as fine a quality of steel as other makes of iron which contain double the amount of those impurities. Although at the present time there are many ways of determining the qualities of iron for melting purposes, at the same time it is the writer's opinion that the microscope can be of considerable assistance to the manufacturer in selecting iron which will have the capacity to withstand the strains and work put upon it after it has been converted into steel. The next essential thing is to properly refine or melt the charge which the crucible contains. The temperature required to do this depends upon what the mixture is composed of. The old process of "killing" is all right so far as it goes, but what is more essential than the "killing" or the length of time it takes to perform the operation is the temperature of the metal during the operation. In fact, it is possible that the mixture may be composed of such materials that they cannot be combined into a homogeneous state in a single operation. The next question to consider after the ingot is cast is whether the refining process has been complete, whether the ingot is practically homogeneous or not. Until that point can be determined, why go any further and waste time and money without getting any positive results? Especially is this so when conducting costly experiments with steel made from different combinations. It is not much satisfaction to find out with the assistance of the microscope after the tests are all over that some of the steel had not been properly melted. The microscope can be of great assistance to the steel manufacturer, not as an instrument to be used at the post-mortem examination to determine the cause of death of the patient, but rather as an instrument to detect the source of the ailment while the patient is still in a curable condition.

# The Automobile Industry and the Machine Tool Trade.

BY CHARLES E. HADLEY, NEW YORK.

The ultimate mission of a machine tool plant is not often easy to predict in these days of reorganization and expansion. This uncertainty always adds to the weight of responsibility of those upon whom devolves the task of organizing a machine plant for the production of a new article.

There is the probability not only of the necessity of radical changes in the design of the product in the earlier stages of its development, but also the prospect always imminent of something new in the machine tool line peculiarly fitted to the requirements of the new industry.

### Bicycle Machinery in Automobile Building.

For the past 15 years the manufacture of bicycles has absorbed a large share of the product of tool builders in the equipment of great factories all over the country, and now that many of the plants are either idle or devoted to other work, the looming up of the automobile industry with promise of gigantic growth suggests the question of how successfully will the superfluous equipment for the former apply to the needs of the latter? What proportion will be entirely superseded and thrown out of use, and what will be required in the matter of new machinery to satisfy the new demand?

That the automobile associates itself in our minds with the bicycle is probably due to the fact that the features which made the bicycle possible—namely, ball bearings and rubber tires—stimulated a second attempt at what had been tried in a small way years before with nothing but the combined traditions of wagon and locomotive experience as an inspiration; and not because of any great simularity between them to-day beyond the fact that both are horseless vehicles on wheels.

Five years ago, however, they were more closely related than to-day, as the bicycle builder, naturally interested in any new form of light transportation, was with perhaps one exception the first in the field and applied more extensively than is the rule to-day the details of bicycle construction which he had so successfully developed.

Influenced moreover by his desire to utilize to the fullest extent his established equipment he has, in a number of instances, made a specialty of light vehicles under which ball bearings, pneumatic tires and wire wheels satisfactorily fulfill the requirements.

Outside of the line of light pleasure vehicles the carriage has superseded bicycle construction in the heavier gasoline cars, in electric carriages for more than two passengers and wagons for freight in the running gear. Wood wheels have displaced wire ones, and in general pneumatic tires and ball bearings have been replaced by solid rubber tires and regulation carriage wheel boxes, with the exception that pneumatic tires are still applied to the high speed gasoline passenger vehicles.

### Bicycle Machinery Development.

During the 15 years or more of the tool development for bicycle construction in this country a very complete system of machinery and special mechanical appliances has matured. In addition to a continuous and heavy demand upon makers of standard machine tools for their goods, the perfecting of plants for economical production of interchangeable parts called for a great variety of special machinery, which was continually being modified or superseded as the exigencies of the trade demanded.

In the beginning, as is usually the case, inventive and engineering talent was applied to the design and improvement of the product rather more intently than to the devising of ways and means of economizing in production.

Plants were at the outset composed of the standard machinery of the day and of that inherited from older plants as a nucleus, to which was added, from time to time, the special devices which the peculiar character of the work suggested. The volume of business was such that the number of parts to be duplicated easily warranted the expense of special machinery, which ultimately made each detail of the construction a practically staple article of hardware, so to speak. Every fad in design that survived a season was liberally provided with special tools for its construction. No class of manufacturers were more open handed in providing the most approved refinements regardless of expense. And not the least interesting department of some large bicycle plants was the museum of special appliances retained as much for sentimental reasons as for any hope that they would ever again be useful.

### Little Bicycle Machinery Retained.

In the general concentration of a few years ago much that was standard in addition to the special machinery was rendered for the time superfluous, owing to the elimination of a large number of plants. A portion of this machinery is now doing duty in automobile plants. Another portion has been distributed through the agency of dealers far and wide for miscellaneous purposes. Tools for use in the construction of wheels, such as rim drilling machines, coiling machines and truing devices, are hardly applicable to automobile work, because even where the wire wheel is still used the larger dimensions of those required for the latter would demand radical changes in the proportions of the tools. This may also be said of the hub drilling tools, the machinery for swedging, threading and heading spokes and the various automatic machines for making spoke nipples.

As to the tools for frames, except those for machining the connecting pieces, drill presses or chucking machines in the case of forgings or punch and drawing presses for sheet steel connections, comparatively little comes under the designation machinery, although composing an important part of a bicycle manufacturing plant. The department in which frames, forks and handle bars were assembled for brazing was well equipped with fixtures and jigs which would in no case apply to the uses of automobile construction. In a large brazing room a small proportion of the forges might apply and much space for enameling be converted to other uses.

Aside from departments like those for steel ball and chain making, which have of late been largely specialized and separated from the bicycle plant, and those already cited, the departments for the production of machined parts are readily convertible to the uses of automobile manufacture.

The large machine shops or tool rooms of bicycle plants, in some instances employing at times as many as 75 to 100 men and fitted with a well chosen assortment of standard machine tools, come in very nicely as a foundation for any kind of an automobile plant. And, in fact, in the present status of the new industry it has become, in a number of cases, the machinery plant of the system.

### Special Machinery in Automobile Plants.

Special machinery will be added with caution to the automobile plant for two reasons: 1, Because the number of parts of a kind to be produced in a day will not warrant a heavy investment in that line, and, 2, because the list of standard tools to-day covers a much wider field than formerly. It includes screw or turret machines embodying almost the freedom of adjustment of the engine lathe, wherein the cost of setting up for a small lot of parts does not absorb what a screw machine operation might save. It includes heavy turret lathes with all the automatic feeds of the engine lathe, in which the operator can take a number of cuts on an awkward casting without the necessity of rechucking, and multiple spindle drill presses adjustable to almost any irregularity of position and spacing between a straight line and a circle, with belt power and strength of frame sufficient to drill six or eight holes simultaneously up to any size demanded in automobile construction. And finally, it includes a variety of pneumatic tools, whose flexibility of application has wonderfully simplified operations in awkward places on large work.

### The Outlook.

While fairly heavy sales of machinery have already been made in the equipment of automobile plants there

has been as yet no such feverish activity in the machine tool market as existed in the palmy days of the bicycle industry. There is little doubt that the manufacture of vehicles—electric, steam or gasoline—will become a great industry. It will be one, however, in which the investment for machinery will be a smaller proportion of the total investment than it was in the case of the bicycle. This is especially true in regard to the electric vehicle, which type has held its own in spite of the slow development of the storage battery.

A very large plant for the manufacture of this last named type requires but a small machine shop force. The product is more of a carriage than a machine. There is a tendency to treat the elements of the combination as distinct units, to be purchased from those who have made specialties of the various articles required. And it is suggested here that a complete vehicle represents too many distinct arts to be economically manufactured by any one organization.

The modern tendency to specialize has not been killed by great industrial combinations, and regardless of the many millions which may be lumped in a few automobile enterprises or perhaps into only one monopoly, it will still be true that chemical, electrical, mechanical and the fine arts will not economically mix.

The machine tool builder will make his influence felt in all these departments, as his work touches at some point everything in the line of manufacturing. He will find himself catering in some instances through very devious channels to the needs of the vehicle industry, which as a result may not get full credit for the activity in the machine tool market which it causes.

The cost of an automobile is high, and the margin of profit is narrow as a rule in the present state of the art. A considerable decrease in the cost of construction will have to be accomplished as development progresses. The necessities of the case, together with the infinite promise in this fertile field, will focus the attention of inventive specialists upon the various elements of the combination and upon the ways and means for their production. And whether this be in the line of batteries, motors, controllers or running gear of electric vehicles, in the matter of engines, speed gearing, carburetors or ignition systems of those propelled by internal combustion or of engines, boilers, burners or pumps for steam carriages, the machine tool builder will be a very important agent of the success which is bound to materialize in this movement.

The product of any one vehicle manufacturer may not warrant a very elaborate refinement of tool plant. But in the factories where many of the details are already practically staples the increased demand will be the foundation for labor saving devices, whose benefits will be felt later in lower prices for the vehicles, whose numbers are regularly increasing in our streets.

Already in these early days of the trade this specialization is appearing. Electric manufacturing companies have added to their plants facilities for the production of vehicle motors and controllers. Makers of gasoline engines have expanded their equipment to enable them to cater to vehicle builders' requirements, as they have already done for yacht and stationary service.

The advertising columns of the trade papers are filled with cuts of all sorts of vehicle details, from an oil cup to a complete running gear all ready for the suspension of the carriage or wagon body, and this all means machinery and tool equipment, some of it old, passed down the line from sewing machine shops even; much of it new, because good second-hand machinery is generally scarce, and further because the persistent keenness of manufacturing competition compels the installation of facilities embodying the latest improvements.

**The Gorjainoff Steel Process.**—At the new Bogolowsk Works in the Oural, Russia, a steel process is in use which has some interesting features. It is the invention of two brothers, Gorjainoff. The plant consists of four charcoal furnaces and four basic open hearth furnaces of 15 tons capacity. There is first charged into the furnace iron or acid lime, or briquettes made of a mixture of three-quarters ore and one-quarter lime. After melting down pig iron is charged either in the fluid or in the solid state. The reaction is exceedingly active. The proportion of ore to pig is about one to five, and about 60 to 70 per cent. of the iron contents of the ore is extracted. Ferromanganese of 80 per cent. and ferrosilicon of 12 per cent. are added, the quantity being about 2 to 3 per cent. of the weight of pig iron charged. When using liquid iron the charge is made in about five hours.

## The Berlin Iron Bridge Company Win an Important Suit.

In the case of the Berlin Iron Bridge Company against the American Bridge Company, tried recently in the Connecticut Superior Court before Judge Ralph Wheeler, a decision was filed December 29 rendering judgment for the former. Judge Wheeler's memorandum of decision is as follows:

"It does not appear that all the members of the Committee of Appraisal took part in the appraisal of the contracts, or that all the members were present at the meeting or meetings held to take action in regard to the contracts, or that all the members were notified to be present at such meeting or meetings. It is held that the action in fact taken was not a legal or valid compliance with the terms of the contracts between the parties. The term 'shop cost' includes labor, material and general shop expense, f.o.b. cars at the works of the Berlin Iron Bridge Company only. Shipments from Youngstown, however, are to be regarded as shipments from the Berlin plant. The term excludes shipments direct from mills to the site of erection, and all sub-contracts are restricted to structural iron and steel work, and include freight, drawings, material, f.o.b. shop, paint, shop labor and general shop expense. General shop expense includes such general expense of the shop, exclusive of transportation and erection, as cannot be classified or distributed, including power, &c., and general administrative expenses of every kind, all of which must go in by a general average or percentage. As the contracts in question had been taken by the Berlin Company, any administrative expenses connected with a contracting department must be excluded in determining the general shop expense of the American Bridge Company in the performance of the contracts.

"Waste may properly be regarded as a part of the cost of material rather than as a part of the general shop expenses, and in view of the price of materials at Youngstown and all the evidence it is found that it was so regarded and treated at that plant. The amount of the expenditures actually made by the Berlin Iron Bridge Company upon the contracts assumed by the American Bridge Company, after deducting moneys received by the Berlin Company on account of such contracts prior to May 12, 1900, was the sum of $30,568.29.

"The evidence, I believe, justifies the following general approximate statement of accounts: Total receipts by the American Bridge Company, $655,741.85; total expenditure, $599,792.62; net profit in performance of contract, $55,949.23; total shop cost of performing the contracts, $259,636.43.

"It is found that there was a clear net profit to the American Bridge Company of more than 15 per cent. of the shop cost of performing the contracts as guaranteed by the Berlin Iron Bridge Company.

"There is due the Berlin Iron Bridge Company from the defendants the sum of $30,568.29, with interest from September 27, 1901. Judgment is rendered in favor of the Berlin Iron Bridge Company against the defendants for the sum of $32,860.91 and costs of suit."

Charles Wessell, a well-known metallurgist, died suddenly on December 30, at the age of 68 years, from a stroke of apoplexy, while riding in an elevated railroad car in New York City. Mr. Wessell was returning home from a business trip to Philadelphia when death overtook him. He was one of the best known metallurgists in the country and had invented a number of alloys. He was metallurgist for the Riverside Metal Company of Riverside, N. J.; the International Smelting & Refining Company, and the Nickel Steel Company of Pittsburgh.

## The Requirements of Machine Tool Operation with Special Reference to the Motor Drive.

The following extracts are from a paper presented at the meeting of the New York Electrical Society, December 17 last. It was read by Charles Day of the firm of Dodge & Day, modernizing engineers, of Philadelphia, by whom all the data were compiled:

I want you to feel that I am constantly speaking in reference to the motor, the course of reasoning pursued naturally leading to electrical transmission, but opposed to the hasty and illogical advocacy usually put forth.

In the machine shop of a short time since, in fact in many of to-day, no one can be found who knows anything of cutting speeds of which different brands of tool steel will permit, the size of cuts that the various machines will pull, the feeds that are or should be used, and so on. In a shop of this character one usually finds the tool steel and machines ordered through a purchasing department, by men who do not understand the first thing about the requirements to be fulfilled or the relative merits of different machines. It has never occurred to such men to study or analyze the conditions, and what seems to be economy to them in many cases represents a most extravagant policy.

Intelligent analysis is the only method to pursue in work of this kind, but we must ever keep before us a broad view of the subject, that the relative importance of the various factors be evident. It is easy to become so interested in a given detail—the motor drive as an example—that its true position in the general scheme is entirely lost sight of and our judgment, as a consequence, is of little value.

### Cost Distribution.

This fact has been impressed upon us so often when aiming at more efficient production, analyzing the conditions in the shop and studying the various methods employed, that I feel we may dwell upon it here. As example, we will consider a plant composed of foundry, machine shop and office, manufacturing complete machines from the crude material. The only way the relative data can be quickly grasped is by presenting it graphically to the mind; the chart, Fig. 1, may be

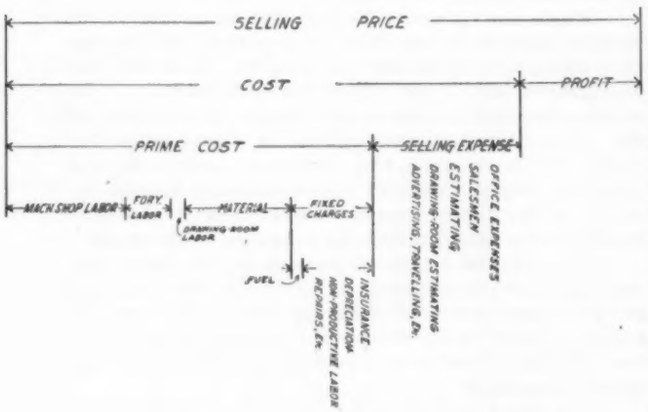


*Fig. 1.—Graphical Distribution of Selling Price.*

taken as the distribution of cost of the finished product of the plant in question.

When the data can be compared in this way the relative importance of each factor can be realized at a glance, the advisability of an expenditure of energy or money in any direction readily determined. In this connection I wish to refer to the indirect savings for which we must ever be alert. For example, a concern manufacturing a standard article may, by a reduction in first cost, make possible a large increase in sales, while in a works of different character no such advantage would be gained.

The value of the graphical method of presenting data of all kinds is too well understood to need further comment here; it may be of interest, however, to some of you to know that we have frequently found it advantageous to lay out executive charts or the course the mail pursues in passing through the departments of a large organization in this way.

Referring again to the graphical distribution of the selling price, the part that is of interest to the shop manager is the prime cost; it should be his object at all times to lower this figure. It is impossible by guess to determine what course to pursue, thorough study of all conditions of the particular case in hand being absolutely essential if we desire to approach an efficient result.

The fact that a shop exists is proof that the articles manufactured are needed, and it must always be the first consideration to fulfill this need to the best advantage. In other words, we must not enforce economy in the shop by sacrificing vital features in the product. I can call to mind half a dozen of the largest plants in this country, establishments noted the world over for their product, whose shops are most inefficient as far as equipment and organization are concerned, but through exceptionally clever design or selling ability the inefficiency of the shop is outweighed many times. This is no excuse for these conditions, and such concerns may, under changing conditions, be seriously affected by the inefficiency to which we refer. It is proof, however, that very few noted establishments have more than a few lines developed to the high pitch demanded by present conditions, the final result being that one will average with another, but from widely different causes.

### Shop Conditions.

We will now devote our attention to shop conditions, and, if necessary, it would be easy to analyze still further the fixed charges, labor and material shown above. The former can be divided into insurance, depreciation, repairs, power, &c. Labor may be subdivided into productive and nonproductive, and material into proportion of steel, cast iron, brass, &c. The more subtle factors, such as sanitary conditions and light, must also be constantly borne in mind. Of all these factors we will consider only the equipment and means which may be necessary to enable the workman to use it to its full capacity.

We must start in the pattern shop or forge department, and see that everything is done to facilitate future handling and machining. A lug on a heavy casting to make it easy to catch hold with the crane, or in some cases additional metal to remove, to prevent the possibility of working too close to the chilled scale, will frequently effect more saving than is possible by other means. I wish to be understood that my remarks from now on will relate to shops doing a general class of work, as it is much easier to arrive at a high standard where parts are duplicated in large numbers. In the latter case we can profit by experience, while in the former we must anticipate each move. In one instance machines are designed for a given duty, while in the second they must be adapted to a certain class of work, and as a result seldom handle any job to the best advantage.

Referring again to the example under consideration, we will suppose the castings have been received in the shop and the method of machining determined upon. A certain amount of metal has to be removed and a definite finish is required, our object being to accomplish this result in the least possible time, or rather at the least expense. Instead of taking any given example, I will now endeavor to outline the course of reasoning which must be applied before we can intelligently answer this question.

### Tool Steel.

The tool steel is the keynote to the situation, and a complete knowledge of its characteristics and possibilities forms the starting point for all further work. Carbon steel will give a finer finish on steel than the air hardening variety, and for form cutters is still largely used. Where heavy roughing cuts are possible air hardening steel has unquestionably replaced it; and, in fact, the recent developments in the processes of hardening have been the direct means of revolutionizing old methods of machine tool design and so-called shop practice.

We must ever bear in mind that best shop practice

should mean "arriving at the desired result at the least cost," and can be used in a relative sense only. We constantly hear machinists condemn a means of arriving at a result irrespective of its merits, their reason being that "it is not good practice." If drilling with a feed of 1-16 inch per revolution gives the desired finish in much less time, it is certainly good practice, and if under these conditions we find a sharp point on the drill is not essential, so much the better. I have cited this particular instance as it recently came under our notice, when experimenting with some twist drills, which continued to do good work when pronounced as ruined by several machinists who were watching the tests.

**Self Hardening Steel.**

The influence of the Taylor-White process has been so revolutionary in character that I feel justified in dwelling upon it for a few moments. The underlying principle of this discovery is clearly shown on the accompanying curve, Fig. 2, which is plotted from values of cutting speeds and temperatures. It will be seen

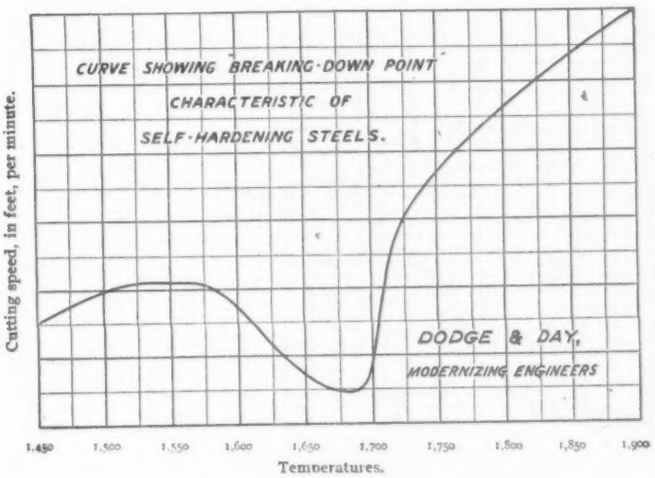


*Fig. 2.—Curve Showing Principle of Taylor-White Process of Treating Tool Steel.*

that this curve rises from the zero point until 1550 degrees are reached, when the cutting values suddenly fall off, this representing the full extent of our knowledge when the experiments at Bethlehem were undertaken. The most interesting and valuable fact, that these values again increase if the hardening temperature is carried beyond the breaking down point, was the result of work just referred to, and the superiority of steel treated in this way as compared with Sheffield Mushet—which was probably equal to any air hardening steel on the market at that time—may be expressed as follows:

| | Mushet. | Taylor-White. |
|---|---|---|
| 10 C. steel | 1.0 | 2.2 |
| 80 C. steel | 1.0 | 3.5 |
| Cast iron | 1.0 | 1.3 |

These figures are the result of a series of tests conducted by the Franklin Institute and represent the facts as nearly as they could be determined. There are now a number of makes of steel in the market treated along the lines explained above, which give equally as good results.

An exact knowledge of the cutting speeds of which these tools will permit when machining different materials and the power to pull various cuts under all conditions are absolutely essential if we wish to properly design machine tools, or use them to their full capabilities in actual service. The value of this information is now being realized by several of the machine tool builders, and the results are already being felt in the shop in the form of much more efficient machine tools. The motor drive makes the measurement of power so simple that we may arrive at these results with comparatively little difficulty. We have recently conducted in the shops of our clients, the Link-Belt Engineering Company, a series of experiments to determine the best air hardening steel for use on cast iron. A portion of the results obtained are presented in the table. One hundred and twenty-five tests on various tools were made in this series of experiments, the depth of cut and feed being kept constant and the speed varied so that the tool would last just 20 minutes. A few experiments will prove of little value, as the factors are so variable in character. The uniformity of the tool must be determined, then the cutting speed for material of all kinds, and finally the relations between these quantities should be ascertained and empirical formulæ derived. This has been done for certain conditions by Carl Barth. With the present light on the subject, it seems strange indeed how machine tools could have been designed in the past, and it is not strange that we can now criticise the course pursued. We do feel, however, that the manufacturers of such apparatus are slow in adopting the proper course, although in every instance we have found them open to conviction and glad to discuss the problem from the present standpoint.

*Experiments on Cutting Speeds.*

November 24th, 1902.
Forging. Cast Iron.
Cutting. Dry. Tool, 1¾ x ¾ in.

Kind of Steel in Tool, Self Hardening
Kind of Tool, Right Hand Roughing
Clearance Angle of Tool, 8 Degrees
Rake Angle of Tool { Front, 2 Deg. / Side, 20 Deg.

| Experiment Number | Feed | Depth of Cut | Cutting Speed in Feet per minute | Mark on Tool | Duration of Cut in minute. | Diam. at Top of Cut, in Inches | Diam. at Bottom of Cut in Inches | Tool started from Top end in Inches | Volts | Amperes | Total Longitudinal Feed of Tool in Inches | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | .0606 | 1/16 | 97<br>91.7 | Taylor White H.S.H. No. 1. | 16¼ | 21⅜ | 21 | 0 | 150<br>134 | 30<br>5 | 16⅛ | Ruined. |
| 25 | " | " | 93<br>100 | Capitol No. 1 | 20 | " | " | 16⅛ | 170<br>172 | 24<br>5 | 21 3/20 | Fair. |
| 26 | " | " | 105.5<br>104 | Capitol No. 2 | 20 | " | " | 37⅞ | 171<br>172 | 24<br>5 | 22 1/16 | Good. |
| 27 | " | " | 104<br>101 | Capitol No. 3 | 13 | 21 | 20⅝ | 0 | 187<br>170 | 27<br>5 | 14 1/20 | Ruined. |
| 28 | " | " | 104<br>101 | Taylor White No. 1 T. W. | 11¼ | " | " | 14¼ | 164<br>174 | 26<br>5 | 12 1/20 | Ruined. |
| 29 | " | " | 100<br>99.1 | Jessop No. 1 | 20 | " | " | 27 | 132<br>135 | 26<br>5 | 20⅞ | Good. |
| 30 | " | " | 105<br>101 | Jessop No. 2 | 20 | 20⅝ | 20 | 0 | 166<br>16. | 24<br>5 | 22 11/16 | Ruined. |
| 31 | " | " | 107<br>107.5 | Jessop No. 1 | 20 | " | " | 2¼ | 168<br>170 | 24<br>5 | 23 | Good. |
| 32 | " | " | 115.5<br>111.5 | Jessop No. 4 | 13 | " | " | 15 1/16 | 168<br>170 | 25<br>5 | 16¾ | Good. |
| 33 | " | " | 125<br>115 | Jessop No. 3 | 9 1/16 | 20¼ | 19⅞ | 0 | 166<br>170 | 28<br>5 | 23¾ | Ruined. |
| 34 | " | " | 118<br>109 | Jessop No. 2. | 10¾ | " | " | 23¾ | 137<br>170 | 28<br>5 | 13 1/16 | Ruined. |

To those who have not given the subject close study this statement may seem to be without foundation, but it matters not what type of tool we consider, its shortcomings can be readily pointed out. The feeds on the average drill press are ridiculously low, the power supplied and rigidity of the frame on machines using multiple cutters are out of all proportion to the work we should be able to absorb at the cut, and so on.

Reference was made above to several tool builders who are breaking away from preconceived ideas of machine design; the roughing lathes made by Lodge & Shipley and the Bullard Machine Tool Company and the Bickford radial coming to my mind in this connection. The Lodge & Shipley reducing lathe was designed to pull, if I remember correctly, cuts aggregating in cross section 3 inches deep and 1-16 inch feed, the cutting speed being 50 feet per minute, and material 50 C. steel.

The belt will deliver 50 horse-power at the tool post, and the construction of the bed is such that this power can be utilized without undue vibration.

I think we are now in a position to consider the method of driving machine tools, the requirements to be met being the following: A machine having been designed for a given duty, its maximum and minimum speeds are limited by the character of the work it will do; the number of speeds is determined by the character of the metal machined and the uniformity of the tool steel, and the power required is fixed by the most severe conditions it must meet.

For the average machine tool we do not think present conditions demand a closer speed regulation than 10 per cent., as no good means has yet been reached for determining the character of the metal, and in the average shop little is understood about the relations existing between feed, speed and depth of cut for various materials.

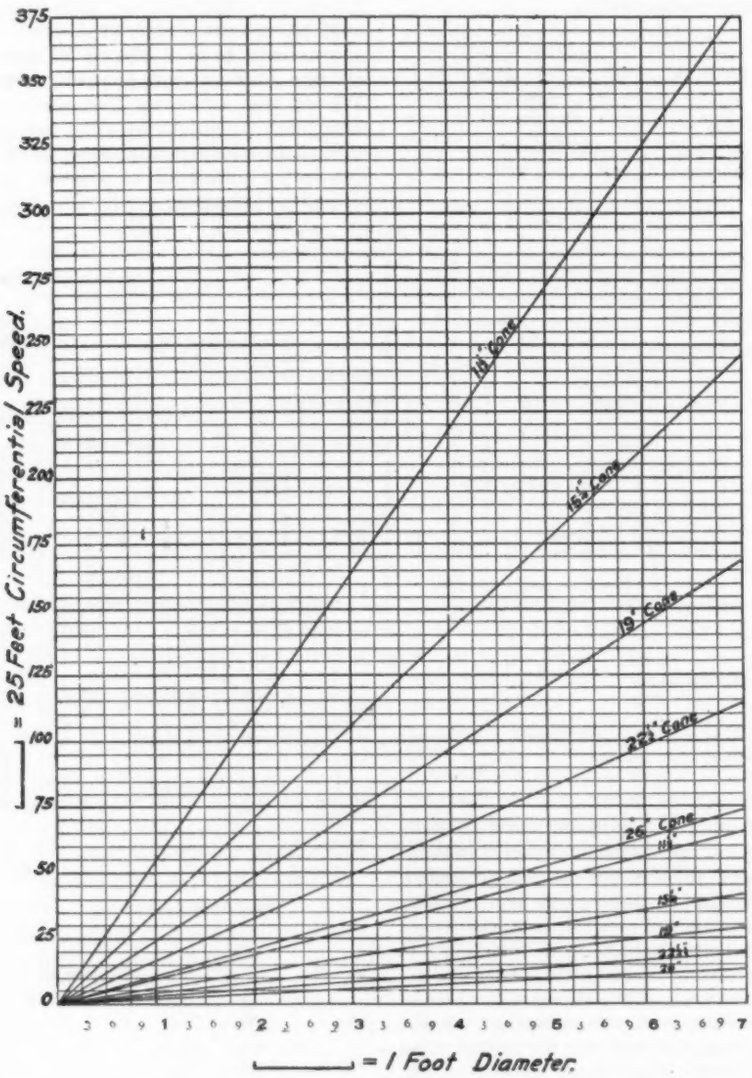


*Fig. 3.—Table of Circumferential Speed for Work of any Diameter.*

**Cutting Speeds.**

For certain classes of work, slide rules based upon the empirical formulæ referred to above seem to us to be the only solution to the problem. By means of these most ingenious rules it becomes possible to instruct the workmen how to do the work to insure maximum efficiency, the feeds, speeds and cuts all being dictated indirectly by the positions of the various handles and gears controlling these factors.

These slide rules must be in the hands of a force of men who are perfectly conversant with machine shop work and able to lay out the course any particular piece should pursue in going through the shop. The value of these rules—if surrounded by the proper organization—has been fully exemplified by Mr. Taylor at the Bethlehem Steel Works, and I imagine most of you are thoroughly acquainted with the story of the development of this plant while under his direction.

The cutting speed for steel is determined by the tensile strength and elongation, while for cast iron the problem is still more complex. The hardness is not only affected by the chemical composition, but the method of cooling and size of the casting, so that we seldom find two castings that will permit of machining at the same speed. It is possible, however, by careful observation and experiment, to ascertain approximately for a given shop the cutting speeds of which various jobs will permit, so it is absolutely essential to have some good means of determining it. It is impossible to judge the speed by eye, even where a man works on the same tool continuously; nor will the character of the chip when cutting cast iron indicate the proper speed.

As a means of remedying this difficulty we have used charts (see Fig. 3), which enabled the men to ascertain the cutting speed from a knowledge of the diameter of the work and location of belt and gears. We have found great difficulty in making the men sufficiently familiar with these charts to use them to advantage, and now feel that the explanation necessary largely offsets their value.

A much better scheme than the charts is the use of tables designating the spindle speed for each point of the controller or position of the belt, as feeds are frequently enumerated on lathes, &c. When slide rules are not used a "speed tally" on each machine would be the only proper way of enabling the workman to know the speed at all times. No skill is required in its use or

time lost in making the reading. A tachometer suitable for this work has not yet been placed upon the market, but on a recent visit to Milwaukee I had the pleasure of seeing one that has been developed and patented by A. P. Warner of the Northern Electrical Mfg. Company of Madison, Wis., and which I think will meet all requirements.

**Motor Drive.**

The motor is a poor investment if, after its introduction, the shop is run along the same old lines, and for this reason an understanding of its possibilities is most essential. I refer, of course, to the motor on individual tools, and, although my remarks are general in character, it is understood that we do not for a moment advise its use on every machine, our views on this subject being rather conservative. The accompanying chart, Fig. 4, was made by us some months ago to show

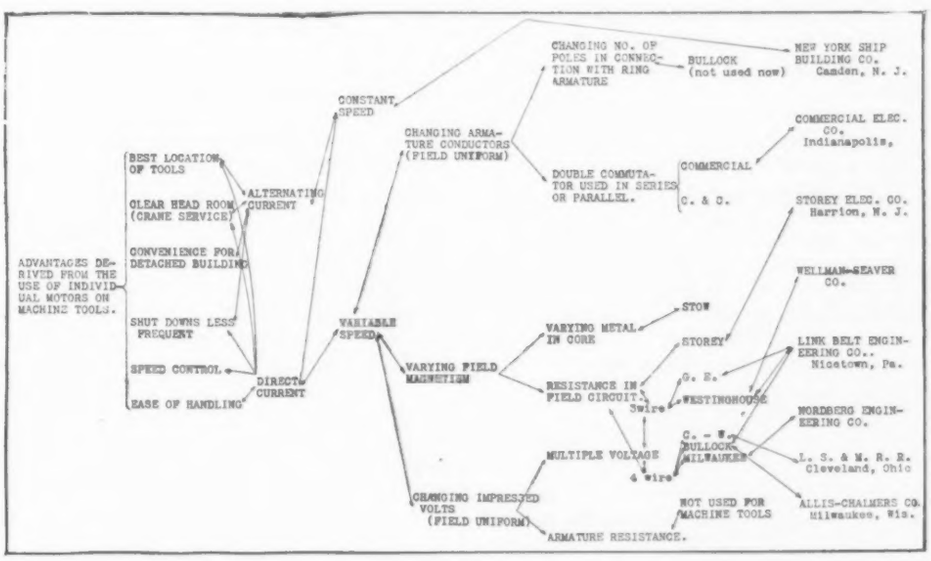


*Fig. 4.—Methods of Driving Machine Tools and Advantages.*

at a glance the different methods on the market for motor driving machines, and may prove of interest here. The constant speed motor, particularly of the alternating type, is so simple in character we naturally turn to it as a possible solution to the problem. It lacks, however, the two great essentials, ease of handling and speed regulation, and all attempts to supply these shortcomings by mechanical means have so far proved unsatisfactory.

The induction motor is a source of power, just as the line shaft, and the principal advantages resulting from its use are clear overhead room, independent location and possibly a saving in power.

The variable speed countershaft would seem to be a natural solution, and in this connection I think I can safely say we have tested all the principal designs on the market. Speaking generally, we have arrived at the conclusion that all such devices that depend upon power transmission through frictions are unsatisfactory for general adoption in the shop, and in most cases the method of handling is not comparable with the multivoltage systems that I will describe later.

We feel that a variable speed countershaft that is to meet with the success anticipated by some engineers must be handled from a master control, and, in fact, do everything that is possible with the highly perfected electrical systems that are now being installed.

Having made up our minds that the ease of handling and close speed regulation cannot be efficiently obtained with the constant speed motor, we will direct our attention to the variable speed type.

I shall not attempt to fully discuss the relative merits of the various systems, as it would be essential to go into details involving a paper equally as long as the present one. Fig. 5 shows the schemes of voltages adopted by the principal manufacturers of multiple voltage apparatus, one sketch showing a three-wire system and the other two four-wire systems, the voltages being arranged in geometrical and arithmetical progression respectively. In the first instance but two voltages are used, while in the latter cases six are possible.

Intermediate speeds are obtained by inserting resistance in the field, 100 per cent. variation being necessary in the three-wire systems, as compared with 30 per cent. in the four-wire. In either case the horse-power that the motor can develop satisfactory is directly proportional to the voltage.

A comparison of the underlying principles of these systems is clearly shown by the accompanying curves, Fig. 6. It is interesting to note the relative sizes of motors required to obtain a given range, but in this connection we must not form a hasty conclusion, as the cost for a given horse-power depends upon the system adopted. That is, with the three-wire scheme there may be a variation in speed of 150 per cent. by field weakening alone, a special field winding being necessary.

The satisfactory operation of these systems can only

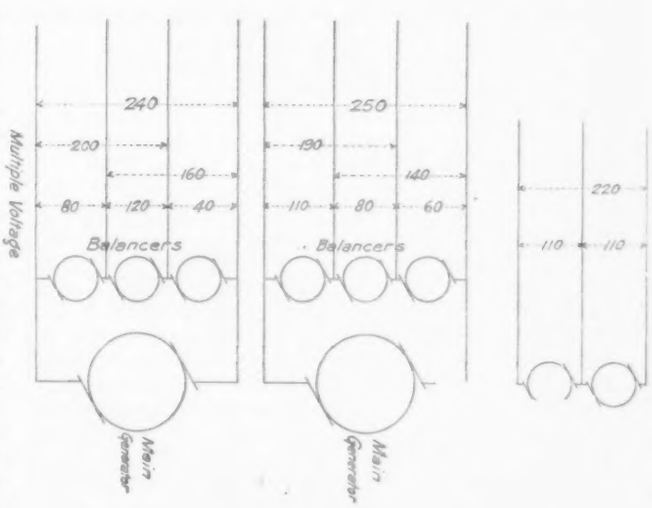


*Fig. 5.—Voltages for Three and Four Wire Systems.*

be ascertained after experience with the apparatus in the shop, so we can readily see how many considerations must be looked into before a final decision as to their relative merits can be reached. In a desirable system standard motors should be utilized, the controller operated by a single handle, and the entire range of speeds passed over while the work continues.

The range of motor speeds is a most important factor, as the first cost of the motor, the cost of the installation and the efficiency of the outfit are all dependent upon it. It is impossible to lay down any fixed rules to base our discussion on, as each machine is a different problem, and must be treated as such. For general machine shop work we have found that a range of 4 to 1 to 6 to 1 adapts itself to all conditions fairly well, but in every case where old tools are being equipped we must be satisfied with a compromise. Thinking that the course we adopt when applying a motor might prove of interest, I have made plates of part of the data to simplify the explanation. The example I have chosen is a 37-inch Bullard boring mill, Fig. 7 showing the train of gears from the motor to the table. The first reduction is fixed by the slowest table speed required.

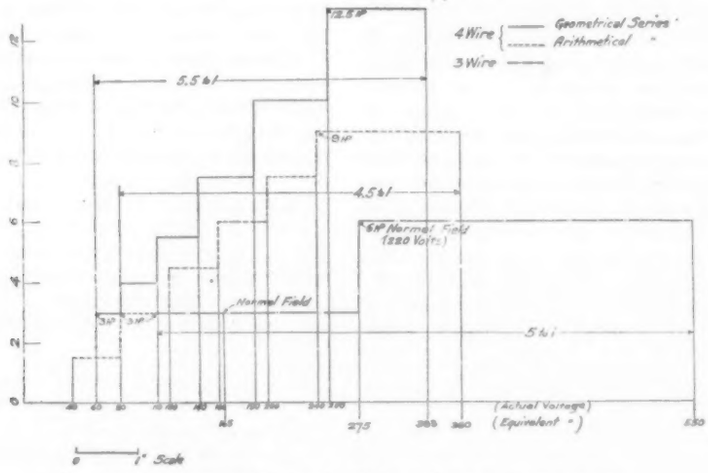


*Fig. 6.—Horse-power Curves of Three and Four Wire Systems.*

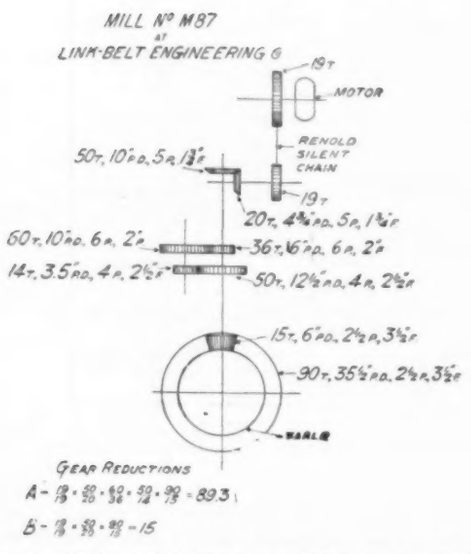


*Fig. 7.—Train of Driving Gears, Bullard Boring Mill.*

| Name of Gear Part | Number of Teeth | Diametral Pitch | Face of Gear | Velocity | Diam. of Pitch Circle | R. P. M. | Tangential Strength by Static Rule | Strength at Tool | Diam. for R. P. M. for Cutting Speed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | |
| Bevel Pinion 3 | 20 | .5" | 1⅞" | 210' | 4" | 200 | 1050 | 3590 | | | |
| " Driven 4 | 50 | .5" | 1¾" | 210' | 10" | 80 | 1350 | 4620 | 17.3" | | |
| Table Pinion 5 | 15 | 2½" | 3½" | 126 | 6" | 80 | 1810 | 3710 | | | |
| Gear 6 | 90 | 3½" | 3½" | 125 | 35½" | 13.3 | 3700 | 7600 | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | 1050 | 8760 | | | |
| 10 | | | | | | | 1350 | 11270 | | | |
| Back Pinion | 36 | 6" | 2⅛" | 125 | 6" | 80 | 790 | 3970 | | | |
| " Driven | 60 | 6" | 2" | 125 | 10" | 48 | 790 | 3970 | 24" Max. Dia | | |
| " Pinion | 14 | 14" | 2⅝" | 44' | 3½" | 48 | 1160 | 2040 | | | |
| Driven | 50 | 14" | 2½" | 44' | 12½" | 13.4 | 1600 | 2820 | | | |
| 6 | | | | 21' | | 13.4 | 2100 | 1774 | | | |
| 7 | | | | 21' | | 223 | 4200 | 3540 | | | |

*Fig. 8.—Table of Gear Data for Fig. 7.*

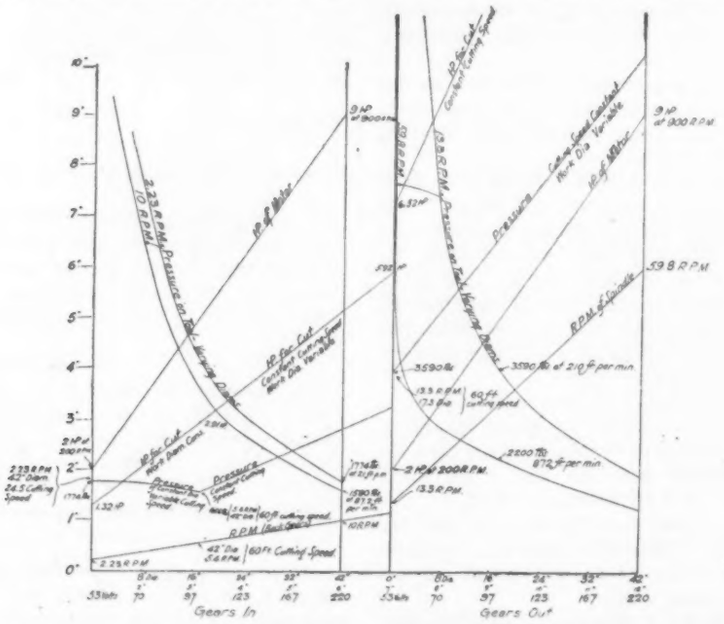
223 R.P.M. Pressure on Top Varying Diam.
H.P. Req'd
H.P. for Cut Constant Cutting Speed Work Dia Variable
2 H.P. at 200 R.P.M.
133 R.P.M. Pressure on Top Varying Diam.
Cutting Speed Constant Work Dia Variable
H.P. of Motor
59.8 R.P.M.
R.P.M. of Spindle
3590 lbs
3590 lbs at 210 ft per min.
133 R.P.M.
60 ft cutting speed
2200 lbs
672 ft per min.
2 H.P. at 200 R.P.M.
133 R.P.M.
Pressure Varying Diam. Constant Cutting Speed
60 ft cutting speed
10 R.P.M.
R.P.M. Work Spindle
42" Dia 24.5 R.P.M.
60 ft Cutting Speed
Gears In
Gears Out

*Fig. 9.—Curves Covering Principal Data Relative to Driving Mechanism of Fig. 7.*

which in turn depends upon the tool steel, the maximum swing and metal machined.

The horse-power is first figured from the maximum cut to be removed, but as the machine is frequently too weak to stand this work it is always essential to investigate the gears and other details. The gear strengths are based upon Wilfred Lewis' formula and the weakest gear is readily determined when the data is gotten into such shape as is shown in Fig. 8. For a given cutting speed the least cross section of cut that can be removed is at the slowest spindle speed of each reduction; the column shown to the right represents the pressure on the tool that can be exerted at this point.

The curves, Fig. 8, cover the principal data relative to the driving mechanism, and show at once the cuts that can safely be removed on any diameter at any speed. The motor horse-power is also plotted and the overload that the gears are subjected to is clearly shown.

I will not enter into further detail along these lines, having only introduced the data to show how many factors must be considered if the correct result is to be arrived at. I am afraid my remarks so far have dealt in generalities to such an extent that the most important question of all—viz., When is the saving sufficiently large to justify the expenditure—has not been satisfactorily answered. I have frequently said that we have endeavored to show by exact figures when it pays to use individual motors, but such reasoning has always proven most unsatisfactory.

We must study present conditions, and in each case see how much they will be bettered by the use of a motor. Crane service alone may be ample reason for its adoption, or, again, where the intelligence of the men or facilities offered make it possible to run each tool to its limit. We must ever remember that the belt drive, as applied to most machines, does not permit of running to the tool limit on the average job, while the motor, if properly installed, offers the opportunity. It can do nothing more. If we cannot accurately figure beforehand what economy will result from the use of the motor, it may at least be of interest to investigate the records of shops who have made such installations.

We must, however, be very careful not to draw too hasty conclusions as to the merits of the apparatus from such investigations, as the equipment is utterly useless without the management and organization behind it.

In the shops of the Link Belt Engineering Company, an accurate record, extending over five years, gives the pound cost of machining, and the reduction in this figure during this period gives a more accurate gauge of the economy affected than any other method. These figures were compiled by a disinterested party, and after taking into account every detail which might in any way introduce an error, and allowing the men a decrease of 10 per cent. in time, with the same wages per week, a clear saving of 30 per cent. on the entire labor bill was shown.

## Notes on Central America.

SAN JOSE, C. A., December 24, 1902.—The present crisis in Venezuela has brought on such an irritation against Great Britain and Germany, in every one of these Spanish-American nations, that I am certain no better time could be found for active canvassing for business on the part of our manufacturers. A good portion of the people in Central America have declared that they will buy no more English or German goods, and as they are greatly swayed by sentiment, I believe they will do as they say.

The Nicaraguan Government intends to continue the Silico railway, and for this purpose large contracts will be made for steel rails and rolling stock. It is probable that a branch line will be run to the Chantales gold and copper mines, as a number of Americans own valuable properties in there, but cannot transport modern mills and machinery over the present roads, which at best only allow of mule travel, and no mule can carry a piece of machinery weighing over 200 pounds on such steep, jagged mountain paths.

The traction railroad to the Matagolpa district is working well, and the next coffee crop will be exported over this route. The National railway from Corinto on the Pacific to Managua on the lake has been completed and is in good working order. Thus the route is now open by rail to Granada on the San Juan River, the principal scene of the Nicaragua Canal.

The recently discovered Aramecius mines in Honduras are now producing upward of $100,000 a month. An American syndicate are shortly to begin work on the Agathea iron and copper mines. The iron ore is magnetite and is found on the surface in huge blocks. This district is so large that no one in the country has ever cared to work them. San Juancito is putting in new machinery and has an output of $80,000 to $100,000 per month.

The Ulna Company are now surveying for a road which will tap the celebrated Olancho gold mining district. It is believed that the line can reach Olancho within two years. The Interoceanic railway across Honduras is doing nothing at present, the British bondholders of the original company having set up claims against the Government.

The disasters through earthquakes and the volcanic eruptions at Mazatenango and Quezaltenango have had the effect if letting big contracts for iron and steel frame buildings to replace those lately lost, which were mostly of adobe and brick. Many of the bridges on the railroad have also been damaged, so that repairs of considerable moment will soon be made.

Electrical machinery is coming into Honduras and Costa Rica in quantities, and the mines at Tres Amigos and Buena Vista will soon be run entirely by electricity.

It is understood that the Northern Guatemala Railroad in the low country will need rebuilding, and steel rails are found to be the only ones to resist tropical conditions.

J. C.

## Business Opportunities in Italy and Sicily.

A correspondent of the *Electrical World*, traveling in Italy and Sicily writes as follows:

Italy, especially in its northern parts, abounds in powerful water falls; on the other hand, every pound of coal has to be imported, and, as a consequence, electricity is, in comparison with other continental countries, making greater progress in Italy than anywhere else in Europe. Even on the Island of Sicily electricity is being more and more introduced. Though the electrical industry in Italy—I mean the manufacturing industry—is steadily growing, the imports of all kinds of electrical machinery, appliances and supplies are not only large, but continuously increasing. Germany and Switzerland get a good share of this trade. The United States is fairly represented, especially in Northern Italy (Lombardy, Piedmont, Liguria, &c.), but there is very little, if any, American machinery to be found in the south of Italy, or on the Italian islands.

I think there is a good opportunity for the introduction of electrical appliances on the Island of Sicily for power, light and transportation. The sulphur mining industry offers an especially good field. I have visited quite a number of the principal mines, and was surprised to see how electricity had made progress. There are in Sicily in the neighborhood of 650 sulphur mines, of which some 400 are being exploited. Of these 400 about 40 are worked by means of modern machinery, and these are, in the first place, the mines which offer a market for electrical enterprise. German and Swiss, and, to some extent, Austro-Hungarian firms, are doing a pretty good business in Sicily. When in Palermo I visited the Esposizione Agricola, where some space was devoted to agricultural and industrial machinery. The only American firms, represented with a few small exhibits, were the Enterprise Mfg. Company of Philadelphia, the Buffalo-Pittsburgh Company of Buffalo and the McCormick Harvesting Company of Chicago. Correspondence should be carried on in Italian or French; catalogues and all printed matter should be in either language. It would be waste of time to address these gentlemen in English.

Business in heavy machinery can be done direct with

the mines, or by means of local agents. The latter are not easily to be found. German and Swiss manufacturers have their own offices in Italy. For the sale of small supplies for power, telephony, &c., electric novelties, lamps and so on, correspondence may be opened with Sicilian firms interested in such branches.

## United States Steel to Share Profits.

### Circulars to Stockholders and Employees Set Forth the Plan.

The United States Steel Corporation, through George W. Perkins, chairman of the Finance Committee, have issued two circulars dated December 31, 1902, setting forth a scheme of profit sharing which is to be put in effect at once. The work of preparing this plan is stated to have extended over six months. It has been approved by all the directors and committees, as well as the presidents of the subsidiary companies. The purpose of the scheme is to keep the employees interested in their work and to retain their services. The first circular is addressed to the stockholders and is as follows:

**Circular to Stockholders.**

*Gentlemen:* Inclosed you will find copy of a circular letter this day issued to the employees of the United States Steel Corporation and its subsidiary companies.

This circular sets forth two plans by which it is hoped to accomplish the following objects—viz.:

1. To interest a large number of the employees of the corporation and its subsidiary companies in becoming permanent stockholders.

2. To engage on a profit sharing basis the services of the presidents, officers, managers, superintendents and all others charged with responsibility in managing the affairs of the corporation, thus making these men actual partners with you in the ownership and management of the corporation.

At the time of the organization of the United States Steel Corporation many of the subsidiary companies were managed, to a greater or less degree, by men who had a very large personal pecuniary interest in them, and naturally gave to the direction of the affairs of their companies a large part or all of their time.

The aim of the Steel Corporation has been to devise some plan by which to maintain this same important incentive, but in place of having it center in comparatively few men, so to distribute its effect throughout the corporation that every man, in his place, would feel that he had become a partner in the business and would work from that point of view.

A profit sharing plan of some kind has seemed to be the only way of reaching this most desirable end, and since the corporation was organized two years ago the Finance Committee has given much thought to the consideration of such a plan.

The plan now announced is one that has met with unanimous approval and it will be tried. After the test of use improvements can doubtless be suggested and all such suggestions will be cordially welcomed and, if practicable, adopted

One of the main purposes has been to devise some plan that with equal fairness would apply to every man, from the president of the Steel Corporation itself to the man with pick and shovel working for one of the subsidiary companies.

In addition it was desired to accomplish the following objects:

1. To interest the large number of young and able employees in the work of more closely organizing and systematizing the business in all its branches and ramifications, not only in connection with their own local concerns, but as an integral part of the Steel Corporation as an harmonious whole.

2. To interest these men in reducing the general expenses as well as the particular cost of manufacture.

3. To offer to these men an inducement to remain permanently in the corporation's service.

4. To avoid the tendency of a profit sharing plan pertaining solely to a constituent company to build up the profits of that company to the possible detriment of the broadest and best interests of the corporation as an harmonious whole, and therefore to base the plan on the profits of the corporation itself.

5. To devise a plan by which, in the apportionment of money for the improvement and development of plants, Company A, for instance, would be interested in what Company B was doing, and Company B in what Company A was doing, constituting, as nearly as possible, automatic regulation against unnecessary duplication of appropriations.

The Finance Committee realizes that the accomplishment of all the above desirable results will severely test any one plan, and the plan recommended may fall short of our expectations. It has, however, been canvassed very carefully with the presidents of all the subsidiary companies, and it has met with their unanimous approval.

It is believed that at the very beginning the plan will interest a substantial number of the most thrifty men, and that eventually it will interest many of them.

It will be noted from the inclosed circular that of the stock which is offered for sale the workingmen have been allowed to subscribe for a much larger amount than the officers can subscribe for. This is because at present it is impossible to devise a plan for sharing with the laboring men profits based on their daily wages; but it is believed that profits can be shared with these men based, so to speak, on stock held by them, and especially with such men as shall continue permanently in the corporation's service. This plan will embrace a large body of men who have no part in the direct management of the corporation's affairs, are not directly responsible for results, and are not able, in any direct way, to affect the cost of manufacture or the net profits as a whole, and yet who, by their faithful service, are able to contribute much to the general gain of the corporation and should be recognized in some substantial manner.

In round figures, it requires $75,000,000 to pay the interest on the corporation's bonds, dividends at the rate of 7 per cent. on its preferred stock, dividends at the rate of 4 per cent. on its common stock, and to make sinking fund deposits.

At this date there are about 55,000 stockholders. These stockholders, of course, own the vast properties of the United States Steel Corporation. It is believed that they and other possible investors in the corporation's bonds and stocks would feel a special sense of security in the continued earning power of the corporation if they knew that the officers and the managing men generally of the entire organization were willing to enter into a contract by which part of their compensation for services rendered shall be paid only after the realization of $80,000,000 of profits; in other words, after interest on bonds, dividends on preferred and common stock, and sinking funds shall have been earned and paid or set aside.

It has been and still is intended, therefore, to make such an adjustment of salaries as shall seem proper in order that every man in the employ of the corporation or of any of its subsidiary companies will feel that he is receiving a fair and reasonable compensation for his services, and that over and above such sum he shall have an opportunity each year to earn a substantial extra sum of money, provided he and his associates shall have been successful in earning for the stockholders a substantial surplus over and above interest, dividend and sinking fund charges. The basis of this is outlined in the accompanying circular.

In the matter of adjusting salaries, we have gone far enough to know that on and after January 1, 1903, we will have in the employ of the Steel Corporation and of all of its subsidiary companies not to exceed 12 men with salaries of $20,000 a year or over. This includes the salary of $100,000, which is fixed as belonging to the office of president of the corporation itself. There will be not to exceed 50 men who will receive from $10,000 to $20,000 a year. There will be about 200 men who will receive from $5000 to $10,000 a year, and something

over 1500 men who will receive from $2500 to $5000 a year.

We believe that the profit sharing plan proposed in connection with the men receiving these salaries will materially quicken the interest of a large number of our men in the general success of the Steel Corporation, and that it will retain them permanently in its service; that it will stimulate individual effort all along the lines, giving us an increasingly solid and compact organization working for one common end, and enabling us to get general support for all plans promising further economies in manufacture and in administration. In this way more than in any other not already adopted can we provide a guaranty of the continued success of the corporation.

An immediate, important, and far reaching result of thus welding together the men of all the subsidiary companies and of interesting them in working for one common object is obtained through the following important arrangement for making appropriations for maintenance, alterations and extensions of plants during the year 1903.

In the past, if any subsidiary company desired an appropriation for any purpose the president of the company made his recommendation to the officers of the Steel Corporation, who investigated it fully and referred it to the Executive Committee, which considered the matter from every point of view, and if approved passed it on to the Finance Committee for final action.

Now that we are to interest the presidents and the other officers of each subsidiary company in the profits of each of the other subsidiary companies, through a profit sharing plan of the Steel Corporation as a whole, it will be found entirely practicable and highly advantageous to have the president of each subsidiary company give his opinion as to the advisability of a contemplated improvement or expenditure on any one of the plants, and to this end regularly to call the presidents of the subsidiary companies together as a manufacturing committee for conference. At such conferences all questions of contemplated expenditures and improvements on any plant will be discussed by the presidents of all the companies, and their recommendation will then go to the officers of the Steel Corporation and to the Executive Committee and ultimately to the Finance Committee.

In the same way questions of purchasing supplies, and other questions of common interest, will be taken up at these presidents' meetings and will be dealt with from the broad point of view of the success of the Steel Corporation as a whole. In short, the idea, as far as possible, is to administer the interests of the Steel Corporation by committee work, and to impress on every one in authority wherever possible and of advantage to the corporation as a whole the importance of making such plant supplement, and co-operate with, every other plant of the United States Steel Corporation.

### The Profit Sharing Plan.

The second circular, giving details of the plan, is addressed to the officers and employees of the corporation and subsidiary companies, and is as follows:

*Gentlemen:* For several months the Finance Committee has been engaged in perfecting a plan which, in its opinion, would make it your common interest to become permanent holders of the preferred stock of the corporation.

The Finance Committee has been endeavoring also to devise some comprehensive plan under which those of you who are charged with the responsibility of managing and directing the affairs of the corporation, or of its several subsidiary companies, shall receive compensation partly on a profit sharing basis.

The committee has not been willing to adopt any system that shall not include every employee, from the president of the corporation itself to the men working by the day in the several subsidiary companies.

A plan which, in the judgment of the Finance Committee, will accomplish these results, was submitted to the Board of Directors at its December meeting, and by unanimous vote the Finance Committee was authorized to proceed to perfect and to promulgate the plan. It is now submitted to you, in the hope and belief that it will receive from all of you the same hearty approval that was given to it by the presidents of the several subsidiary companies, who were freely consulted while the plan was being thought out and put into shape.

The plan is divided into two parts:

#### Part One.

From the earnings of the corporation during the year 1902 there will have been set aside at least $2,000,000, and as much more as is necessary, for the purchase of at least 25,000 shares of the corporation's preferred stock for the purpose of making the following offer to all the employees of the Steel Corporation and of its subsidiary companies:

At the present time there are in the service of the corporation, and of its subsidiary companies, about 168,000 employees, whom we propose now to divide into six classes, as follows:

Class A will include all those who receive salaries of $20,000 a year or over.
Class B will include all those who receive salaries of from $10,000 to $20,000 a year.
Class C will include all those who receive salaries of from $5000 to $10,000 a year.
Class D will include all those who receive salaries of from $2500 to $5000 a year.
Class E will include all those who receive salaries of from $800 to $2500 a year.
Class F will include all those who receive salaries of $800 a year or less.

During the month of January, 1903, the above mentioned stock will be offered to any and every man in the employ of the corporation, or any of its subsidiary companies, at the price of $82.50 per share; subscriptions for this stock to be made on blanks obtainable at the office of the treasurer of any subsidiary company.

Every man can subscribe for as much stock as he chooses, not to exceed the sum represented by a certain percentage of his annual salary, as indicated in the following table:

Any man who belongs in class A, as indicated in the preceding classification, will be allowed to subscribe for an amount of stock represented by a sum not to exceed 5 per cent. of his annual salary:

Class B, 8 per cent.
Class C, 10 per cent.
Class D, 12 per cent.
Class E, 15 per cent.
Class F, 20 per cent.

If, on this basis of subscription, more than 25,000 snares shall be subscribed for, 25,000 shares will be awarded to the several subscribers in the order of the classes beginning with the lowest or class F, the upper classes to receive only in case any stock shall remain untaken by the class below, and each class to receive ratably in the amount left for that class if there be not enough to satisfy the full subscription of that class, but each subscriber will be allotted at least one full share, even though this might make it necessary for the Finance Committee to purchase more than 25,000 shares.

Payment of the subscriptions for the stock must be made in monthly instalments, to be deducted from the salary or wages of the subscriber, in such amounts as he may desire, not to exceed 25 per cent. of any one month's salary or wages.

A man may take as long as he chooses, not exceeding three years, to pay for his stock.

Dividends on the stock will go to the subscriber from the date on which he commences to make payments on account of his subscription.

Interest at 5 per cent. will be charged on deferred payments on the stock.

In case a man shall discontinue payments before his stock shall have been fully paid for, he can withdraw the money he has paid on account of principal and may keep the difference between the 5 per cent. interest he has paid and the 7 per cent. dividend he has received on the stock; and thereupon his subscription and all interest on the stock to which the same relates shall cease and determine.

As soon as the stock shall have been fully paid for, it will be issued in the name of the original subscriber and the certificate will be given to him, and he can then

sell it any time he chooses. But as an inducement for him to keep it and to remain continuously in the employ of the corporation or of one or another of the subsidiary companies, and to have the same interest in the business that a stockholder or working partner would have, the following offer is made—viz.:

If he will not sell or part with the stock, but will keep it and in January of each year, for five years, commencing with January, 1904, will exhibit the certificate to the treasurer of his company, together with a letter from a proper official, to the effect that he has been continuously in the employ of the corporation, or of one or another of its subsidiary companies during the preceding year, and has shown a proper interest in its welfare and progress, he will, during each of such five years, receive checks at the rate of $5 a share per year. For example: If a man buys one share of this stock in January, 1903, he will undertake to pay $82.50 for it. If after paying for it he keeps it for five years he will in each year have received dividends at the rate of 7 per cent. on the par value of the stock, and also will have received each year an extra dividend, so to speak, of $5; this latter sum being paid him as special compensation for rendering continuous faithful service to the corporation or to one or another of its subsidiary companies, as shown by the exhibition of his certificate together with a letter from a proper official showing that he has worked to promote the best interests of the company in which he has thus become practically a partner.

If he shall remain continuously in the service of the corporation or of one or another of its subsidiary companies for five years, at the end of the fifth year the corporation intends that he shall receive a still further dividend, which cannot now be ascertained or stated, but which will be derived from the following source —viz.:

All who subscribe for stock in January, 1903, and commence to pay for it, but who discontinue at any time during the five years, of course will not receive the $5 per share for such of the five years as remain after they discontinue. The corporation will, however, pay into a special fund each year the $5 payments that would have been made to such subscribers had they continued. This fund shall be credited with 5 per cent. annual interest, and at the end of the five years' period the total amount thus accumulated will be divided into as many parts as shall be equal to the number of shares then remaining in the hands of men who shall have continued in such employ for the whole five years, and the corporation will then by its own final determination award to each man whom it shall find deserving thereof as many parts of such accumulated fund as shall be equal to the number of shares then held by him under this plan:

Provided, however, that if a subscriber shall have died or shall have become disabled while faithfully serving the corporation or one or another of its subsidiary companies, during such five years' period, the money theretofore paid by him on account of the stock he was purchasing, or, if he has fully paid for it, the certificate of stock may be turned over by the corporation to his estate or to him, together with a sum equal to $5 per share for each of the five years not then expired.

If this plan shall be received favorably and shall meet with success, it is intended at the close of next year to make a similar offer, excepting, of course, that the price at which the stock then will be offered cannot be guaranteed now; it is, however, the intention to offer it at about the then market price, and in all other respects to make the terms of the offer similar to those now submitted.

The continuation of this policy would make it possible for a man to buy one or more shares of the stock each year under a contract with the corporation upon terms offering a safer and more profitable investment than he could possibly find for his savings anywhere else.

**Part Two.**

During the year we have been and are now engaged in making changes and adjustments in the salaries of the men who occupy official and semiofficial positions and who are engaged in directing and managing the affairs of the corporation and of its several subsidiary companies in all the various branches of the departments of mining, manufacturing and transportation.

We have been making these changes preparatory to maugurating, on January 1, 1903, a plan by which all the men who are thus directly and indirectly charged with the responsibility of managing and operating these vast properties, will share with the stockholders in any profits made after a certain amount of annual net earnings shall have been reached, and to this end the following plan has been adopted:

In round figures it requires about $75,000,000 to pay the interest on the bonds of the corporation and of its several subsidiary companies, the dividends on the preferred and common stock, at the rates now being declared, and to make sinking fund deposits.

The Board of Directors has approved the recommendation of the Finance Committee to the effect that

Whenever $80,000,000 and less than $90,000,000 is earned during 1903, 1 per cent. shall be set aside;
Whenever $90,000,000 and less than $100,000,000 is earned during 1903, 1.2 per cent. shall be set aside;
Whenever $100,000,000 and less than $110,000,000 is earned during 1903, 1.4 per cent. shall be set aside;
Whenever $110,000,000 and less than $120,000,000 is earned during 1903, 1.6 per cent. shall be set aside;
Whenever $120,000,000 and less than $130,000,000 is earned during 1903, 1.8 per cent. shall be set aside;
Whenever $130,000,000 and less than $140,000,000 is earned during 1903, 2 per cent. shall be set aside;
Whenever $140,000,000 and less than $150,000,000 is earned during 1903, 2¼ per cent. shall be set aside;
Whenever $150,000,000 and less than $160,000,000 is earned during 1903, 2½ per cent. shall be set aside.

It is intended that not only the presidents, officers, managers and superintendents shall share in these profits, but they shall be shared in as well by all other men charged with responsibility in managing the affairs of the corporation, and the final selection of the men who shall share is to be made by the Finance Committee of the Steel Corporation.

The question of what constitutes profits and all other questions shall be determined solely and finally by the Finance Committee, and as this committee will have no interest whatsoever, directly or indirectly, in the profit sharing plan, its rulings must be accepted by all as fair, impartial and conclusive.

We may not, in the first year, get an equitable apportionment, but it is not the intention to make permanent the above schedule or the apportionment of the same. The programme is hereby announced as the plan for the year 1903, and the Finance Committee reserves the right to modify any apportionment that is made at the end of each quarter during the year, and reserves the right to announce this or any other plan as a substitute for this, at the end of 1903 for the year 1904.

Any profits distributed under the above schedule and to the above classes of men will be paid out as follows, for example: If $80,000,000 be earned during the year 1903, then $800,000 would be the sum set aside for distribution. It is proposed to distribute one-half of this sum in cash quarterly during the year; reserve the other half until the end of the year; and then invest it in preferred stock; divide the amount of stock thus purchased, distributing one-half to the employees who are entitled to it, and holding the other half in the hands of the treasurer of the corporation, giving each man a certificate for his interest, the certificate to recite among other things:

1. That if he remains continuously in the service of the corporation or of one or another of its subsidiary companies for five years, the stock shall be delivered to him and he may do as he likes with it.

2. That if he dies or becomes totally and permanently disabled while in the employ of the corporation, or of one or another of its subsidiary companies, the stock will be delivered to his estate or to him.

3. That he can draw the dividends declared on the stock while it is held for his account and he remains in the employ of the corporation or of one or another of its subsidiary companies.

4. That if without previous consent voluntarily he

shall have quitted the service of the corporation or of its subsidiary companies, he shall forfeit all right to this stock, and in such case it will be held in a fund which at the end of five years will be divided among such employees as shall have complied with all the conditions.

Thus 25 per cent. of all the money set aside in this profit sharing plan will be held for five years and will be given to such only as at the end of that period shall be in the employ of the corporation or one or another of its subsidiary companies from and since January 1, 1903.

As the value of the interests of the United States Steel Corporation in the several subsidiary companies necessarily will be enhanced by everything that tends to increase their efficiency and earnings, this offer includes their employees as well as those of the corporation itself.

## The Terms of Union Steel Company Purchase.

Last week at Pittsburgh a letter was issued by the Sharon Steel Company, setting forth the terms under which the properties of that concern were acquired by the Union Steel Company, and by which the properties of the two concerns were later taken over by the United States Steel Corporation. The letter, which is signed by George W. Darr, William Flinn, John Stevenson, Jr., and J. P. Whitla, all of the Sharon Steel Company, in full, is as follows:

"On November 2, 1902, the undersigned entered into a written agreement with A. W. Mellon, R. B. Mellon and W. H. Donner, whereby said parties agreed to complete the organization of the Union Steel Company (hereinafter called Union) and to vest in it certain properties as therein set out, and the undersigned agreed to sell and transfer to Union at least the majority of the capital stock of the Sharon Steel Company (hereinafter called Sharon), and to accept in payment therefore stock of Union. The amount to be received in case we should deliver all of the capital stock of Sharon was $13,500,000 in stock of Union, and to be reduced proportionately in case we should deliver less than the full amount of said stock. The amount of stock of Union to be received in payment for the stock of Sharon, however, was further dependent upon the result of an audit of the books of the company as to its cash investments and net assets, which provisions of said agreement so far as they relate to the amount to be paid for the stock of Sharon are as follows:

"'The parties of the second part, William Flinn, George W. Darr, John Stevenson, Jr., and J. P. Whitla, guarantee that Sharon has a cash investment, including net profits in its plant and properties and excluding all expenditures on or for ore properties, amounting to $11,000,000, less 5 per centum commission paid for the sale of its bond issue of $3,000,000.

"'The valuations so fixed are subject to verification by auditors to be appointed by the parties hereto, each party hereto selecting the party or parties to audit the books of the other party.

"'The amount of stock to be received by the parties of the second part and their associates shall be increased or diminished by the amount of the investment in Sharon, ascertained as above provided, as shall be found by the auditor to exceed or fall short of the sum of $11,000,000.

"'It is further understood that each party hereto hereby guarantees to the other that the assets herein described are net assets after providing for the payment of all current liabilities.'

"Since the making of this agreement, however, the plan has been materially changed by a further contract, whereby all the parties to the said agreement of November 20, 1902, have agreed with the United States Steel Corporation that the Union Steel Company shall be organized and continued substantially as provided in said original agreement, and shall acquire the properties therein mentioned, including at least a majority of the capital stock of the Sharon Steel Company, and that thereupon all of the capital stock of Union shall be sold and transferred to the United States Steel Corporation in consideration of that company guaranteeing $45,000,000 bonds of Union. Under this latter agreement and a correction thereof dated December 22, 1902, we are to receive for all the stock of Sharon $12,887,000 in bonds of the Union Steel Company, the payment of both principal and interest of which bonds is to be guaranteed by the United States Steel Corporation by a guarantee indorsed upon each bond. If we deliver less than the full amount of Sharon stock, the amount of bonds to be received is to be reduced proportionately.

"This agreement, however, further provides: 'The provisions of the agreement of November 20, 1902, for the ascertainment of the cash investment in Union and Sharon, and the provisions whereby each party guarantees to the other that the assets therein specified are net assets, shall be adhered to and carried out. The venders, the undersigned and R. B. Mellon, A. W. Mellon and W. H. Donner, shall furnish the Steel Company copies of the reports of the auditors appointed under said agreement, showing the result of their examination of the books of the Union and Sharon, and thereafter the Steel Company shall have 15 days within which to examine and verify the same, for which purposes it shall have full access to the books and papers of said companies.'

"It is further provided in said agreement that all disputes as to questions of fact arising thereunder shall be settled by arbitration.

"The audit of the books of Sharon, provided for by the original agreement, is now being made, but has not yet been completed. We are, therefore, unable to say whether the cash invested and the net assets will turn out exactly as guaranteed by us in said agreements, but according to our best information each stockholder of Sharon turning in his stock will receive for stock of the par value of $1000, approximately, two $1000 bonds and scrip redeemable in bonds to the amount of $100. Scrip will be issued only for fractional parts of bonds to which depositors may be entitled.

"The bonds of Union above referred to are part of a total issue of $45,000,000, to be made by said company of 50-year 5 per cent. gold bonds, free of tax, to be secured by a first mortgage and collateral trust deed to the New York Security & Trust Company of New York, as trustee, covering the property and franchises of the company, including the shares of stock of Sharon acquired by it. The mortgage will also contain provisions requiring Union to pay 2 per cent. per annum on the total amount of bonds outstanding into a sinking fund for the further security of the bonds, and the bonds are to be redeemable after December 1, 1907, at 110 and accrued interest. All of said bonds not required to pay for the properties acquired by Union can be used only for the acquisition of additional properties by Union, or the making of improvements upon properties of Union. Payment of the principal and interest of all of said bonds is to be guaranteed by the United States Steel Corporation.

"All stockholders of Sharon desiring to dispose of their stock upon the same terms as are received by us may do so by depositing their certificates of stock with the Union Trust Company of Pittsburgh on or before January 8, 1903."

James W. Arrott, one of the best known business men of Pittsburgh, died at his home at Osborne, near that city, on Monday night, December 29, from the effects of a stroke of apoplexy. Mr. Arrott was a native of Ireland, having been born in County Donegal, and came to this country when a young boy. His first employment was in a Philadelphia mercantile establishment. In 1859 he came to Pittsburgh and started an insurance agency, in which business he had since maintained an interest. In 1875 he was interested in the organization of the Standard Mfg. Company, and when this concern were absorbed in 1899 by the Standard Sanitary Mfg. Company, who were then composed of the six largest manufactories in the United States of sanitary goods, Mr. Arrott was a prominent factor in this transaction. Shortly after that time he severed his connection with the company and later organized a company who are erecting an independent plant.

# The Eight-Hour Law.

## Further Protests.

WASHINGTON, D. C., January 6, 1903.—The Government departments and the leading contractors for Government work of various kinds have already begun to feel the effect of the pending eight-hour bill. In anticipaction of its possible enactment manufacturers in all parts of the country are serving notice upon the Departments that should the bill become a law they will decline to bid on Government work either as contractors or subcontractors. In cases where manufacturers have continuing contracts involving tenders at fixed or open market prices, notice is being given that should the bill become a law such tenders will be withdrawn and the contracts canceled. The Navy Department, in particular, is receiving a number of such notices, and the fact has been made very clear to the Secretary of the Navy and his aides that the Department would be most seriously embarrassed should the bill pass either as reported in the House or in the Senate.

But the indirect effect of the measure upon the Government is likely to be even more important. Subcontractors in a variety of trades are serving notice on their principals that they cannot continue to handle Government work if the eight-hour bill becomes a law, and that tenders of standard materials and supplies will be made hereafter with the distinct understanding that none of such material is to be used for Government work in the event of the passage of the bill. A significant case in point is that of the William Cramp & Sons Ship & Engine Building Company, who are in receipt of the following communication from the American Steel Casting Company of Chester, Pa.:

"Referring to our tender of July 26 (M-1824) covering price on steel castings which may be required in the construction of United States cruisers, authorized by last Congress, we beg to advise you that our tender as quoted in the letter of the date and number mentioned in the foregoing will be invalid in the event of the Eight-Hour Labor act, as applying to Government work, becoming a law."

Another prominent Government contractor has advised one of the Government Departments that hereafter all contracts to which he is a party must contain, in addition to the usual strike clause, a stipulation that the contract shall be canceled in the event that Congress passes an eight-hour bill. This communication raises the very interesting question as to whether the bill, if enacted, could be constitutionally made to apply to plants working on contracts executed before the passage of the law. It goes without saying that the contractors would be heavy losers, but none of the advocates of the bill in Congress have considered this phase of the question, nor are they willing to express an opinion upon the point at this time.

No industry is taking a more active part in the effort to prevent the enactment of this obnoxious legislation than the large producers of iron and steel and other metal manufacturers. Many significant communications have been received from these manufacturers by leading Senators on both sides of the chamber, extracts from a few of which are presented below:

**Allis-Chalmers Company, Chicago** (Engines, &c.).—The exactions of the proposed bill are mandatory, and to conform to them would necessitate a reduction in hours from the existing schedule now covering our shops as regards that particular work and which, if done, would serve to greatly disorganize our forces. It is quite impossible to work a portion of our crews on one schedule and the balance on another, and any regulation affecting hours would extend to our whole forces of nearly 5000 employees. It would as well furnish an opening for them for the discussion of the mooted question as to what should constitute a day's work, and from which dissatisfaction and discord is sure to follow. It would lessen the output of the shop, and consequently the cost of manufacture would be increased proportionately. This same applies to subcontractors who are likewise affected, so that it would simply occasion considerable increase in price on Government work over that which it would pay under present conditions. We have now on hand contracts for furnishing pumping engines for the District of Columbia, amounting to many thousands of dollars, which were taken under conditions existing at the time, and were this bill to be retroactive, we would not be able to furnish the plant without much loss. Having works in several States, we respectfully protest to you against passing the bill, which, as proposed, is decidedly prejudicial to our interest, and if passed would not accrue benefits to the public compensatory to the damage it would do. We are and have been at all times glad of the opportunity to compete for work for the Government, but we would be reluctant to do so if the above bill became a law.

**Detrick & Harvey Machine Company, Baltimore, Md.** (Machine Tools).—If the proposed bill became a law, we would not bid for any Government work. If the eight-hour bill became a law it would mean the employment of firemen, engineers, &c., an equivalent number of hours at the same pay that they are now receiving for nine hours' work. To a plant working on a nine-hour basis this means an increase in the cost of production of about 12½ per cent. To the increased cost of production, by reason of the change from nine to eight hours, the employer must add the increased interest on the plant, due to the decreased production of the same. In our opinion, general trade conditions will not stand this increased cost. A radical step such as this contemplated eight-hour bill would, in our judgment, seriously handicap the American manufacturer in competition with the manufacturers of other countries. Unless every manufacturer in all States worked on an eight-hour basis it would seem that we could not in any way compete, and, therefore, our industry could not exist.

**Otis Steel Company, Cleveland, Ohio** (Steel Castings, Forgings, &c.).—We regard this as one of the most vicious and dangerous bills that has ever been offered in Congress. It is contrary to the principles of economics, and would be a great injury to both employer and employees. We believe that the union leaders who are urging the eight-hour movement are doing it, if sincere, on very shortsighted and selfish motives. We believe it is absurd to expect that the laborer can earn as much in eight hours as he can in ten, measured by the purchasing power of his wages; but the argument largely used by the leaders is that the workman can get as much for eight hours as he can for ten hours. In fact, where the demand for the eight-hour day is made it is always coupled with a demand that there shall be no reduction in the wages paid for the longer day. This is a union movement strictly, and as the unions comprise only a small percentage of the labor of the country, it is evidently a movement on their part to get something at the expense of nonunion labor. From the manufacturers' standpoint the bill is, of course, exceeding objectionable, as it would cut down the product of his establishment 20 per cent. if worked on single turn, and if worked on double turn it would be necessary to employ three shifts of men where there are now only two. It would be impossible, under present conditions, in many cases, to find the required number of men, and it would render it impossible to meet conditions where a few hours' overtime would suffice to turn out the work without the necessity of working double turn.

**American Hardware Corporation, New Britain, Conn.** (Hardware, &c.).—The Government assumes to dictate to manufacturers in all parts of the United States how they shall conduct their business, when, in fact, the local conditions determine especially the hours of labor, and we do not understand it to be one of the functions of the Government to dictate to a private individual how he shall conduct his business. It is absolutely impossible for a manufacturing corporation to conduct its business and furnish material on an eight-hour day while the general run of the product is made on a ten-hour basis. A law of this kind would very largely increase the cost of all supplies which the Government may use. I am aware that it is argued by labor leaders that a man can do as much work in nine hours as he does at the present time in ten hours, and in eight hours he can do as much work as in nine hours, but

by own experience in manufacturing—extending over the past 25 years—with a ten-hour day and with a nine-hour day proves conclusively to my own mind, that, as a matter of fact, workmen do not no nine-tenths as much work in nine hours as they do in ten hours; that the decrease in production is greater than the decreased number of hours.

**Link-Belt Engineering Company, Nicetown, Pa.** (Link Belting, &c.).—Should this bill, limiting the hours of daily service of laborers, &c., employed on Government work, be enacted into law, manufacturers who undertake Government contracts in addition to other work for the open market will be at a manifest disadvantage in competing with those manufacturers who do not bid upon work for the Government. Again, under a law as proposed, workmen who have any part in construction of Government work will be limited to eight hours' labor in each day on which they take any part in such work. The operation of such a law would, in our judgment, be as antagonistic to the real interests of the industrious workman as to those of the employer, and it is, therefore, in no spirit of selfishness that our objection to the proposed bill is laid before you.

**Lukens Iron & Steel Company,** Coatesville, Pa. (Iron and Steel Plates, &c.).—No person with a Government contract, under penalty for completion within a limited time, could arrange to work overtime, even by paying extra wages, in order to complete the contract as contemplated, even though delays creep in entirely beyond the control of the contractor. It would seem that this law, if passed, would be unconstitutional, because of class legislation, inasmuch as it proposes to exempt railroads and transportation companies; and why should not any workman be permitted to work overtime, especially if double wages per hour are given him, if he sees fit? Why should the free agency of any man be taken from him? Then, too, the ownership of material manufactured by any company remains with that company until the Government has finally accepted it at the completion of the contract, and should not have any say in matters such as this; it is entirely outside of their prerogative. Our export trade would be a thing of the past, furthermore, were this bill to pass. It is dwindling down to pretty small proportions at the present time as it is, in view of the failure to pass a suitable shipping bill to encourage the export of our manufactories. Why cut it off altogether by passing such a bill as this?

**Bridgeport Brass Company,** Bridgeport, Conn. (Brass Goods).—We desire to enter an emphatic protest against the so-called Eight-Hour bill. We are constantly engaged in fulfilling contracts for manufactured material for the United States Government, and it is very rarely that there are no such contracts in process of completion in our mills. The nature of our business is such that it would be impossible for us to make a separation between work done on account of the Government and that done for private account, without completely demoralizing and possibly destroying the organization of our business. The passage of the measure above referred to would leave us with but one alternative, to either refuse all Government orders, contract our business, and throw large numbers of our employees out of work, or else cut down the working time of our entire establishment to eight hours per day. This latter action would, under present conditions, be impossible, as it would necessitate either the abandonment of our business or the reduction of the wages of our employees to an amount which would actually be a hardship to them. We hope that your committee will realize the serious results to manufacturers of the passage of such a bill as proposed.

**Garry Iron & Steel Company,** Cleveland, Ohio (Structural Iron and Steel, &c.).—It is extremely vital that every manufacturer should have the right to employ such labor and work such number of hours as seems best for the manufacturer and satisfactory to the men. It would be impossible for us to do Government work if compelled to adhere to the eight-hour day. Our men are now willing to work overtime if necessary to assist us in getting out rush orders, thereby pleasing our customers and helping themselves.

**Farrel Foundry & Machine Company,** Ansonia, Conn. (Heavy Machinery, Chilled Rolls, &c.).—In the first place we do not believe the bill is constitutional. Secondly, we are doing more or less work for the Government from time to time, and have just taken a contract within a week. If this law were in force we should simply have to decline to bid, as it happened to be on rolls, and all the other roll manufacturers are running nine or ten hours a day, to say nothing of overtime. The inevitable result would be that the Government would have to make its own rolls, and as the Government only uses a very few thousands dollars' worth in the course of the entire year, the result would be that the cost of these rolls would be increased probably five to ten fold, as much experience is required in making this product. Indeed, if the Government got out of it for five times what it costs them now it would be exceedingly lucky. We give this reason because it hits our own business and because we are acquainted with the facts of the case, and because we know what we are talking about in this particular instance. The trouble and expense to which the Government would be put in making a few hundred or thousand dollars' worth of chilled rolls would be very great, and while they might be justified in it if any great principle were at stake, they certainly would not be in this case. If the Government should try to legislate as to the number of hours, why should it not legislate on the question of a minimum wage? The only ground on which it can legislate is that it is for the public good. Doubtless many people will be found who will claim that a $5 a day minimum wage would be a good thing. Others might put it higher. Another reason may be given—that it is strictly class legislation. As we understand it, railroads and transportation companies are left out. W. L. C.

## Cultivating the Good Will of Employees.

Alexander E. Outerbridge, Jr., of Philadelphia, relates the following in a paper contributed to the *Annals of the American Academy of Political Science:*

About 14 years ago I began a series of metallurgical investigations in the establishment with which I am still connected that resulted in a considerable change, an absolute change in fact, in the character of the metal operated upon by some of the machinists. These men were, at that time, inclined to be suspicious of any change, and there was a theory ever since the days of the machining of iron that it was impracticable to do what we were attempting; it met with great incredulity, and when several very large castings thus treated were sent to the machine shop to be planed and drilled to make finished machines opposition began immediately to come from the mechanics, who were not interested in anything that might go on in the foundry department. It was necessary for me, therefore, to walk around through the machine shops every day to examine these castings so as to find out whether the new treatment had interfered in any way with the work of the machinists; and, as I have naturally a genial feeling for my fellow man, I would always say "Good morning" to the mechanics tending the machines. I found that this salutation was a surprise to these men, for they were not accustomed to it; some of them had been there for 40 years or more and had rarely heard "Good morning" said to them by any one in authority. It was not the custom, but I was not aware of that. One man replied to me: "What did you say?" and I said again, "Good morning." Well, in the course of time these workmen began to realize that the new metallurgical method was not interfering in any way with their wages; that it did not take any longer to finish up the work, and that was what they were interested in, as they were paid by the piece. So, after a while, I began to notice a change in the faces of these operatives when I said "Good morning," and a good many said "Good morning" to me; but one man had told me in the beginning that I was going to take the bread out of the mouths of his wife and children, and having once said that, he was not a man to take back his word as long as he could help it. Time went by, and never did I get any answer from this man to my morning salutation, although all the others had forgotten

their original objections and had become most friendly, until one day when I came along he muttered some oaths, and then, to my surprise, I noticed a smile stealing over his countenance, and he said: "It isn't any use trying to make you mad; here's my hand." That was very amusing to me, but it was a conquest after years of patient waiting, and to this day we are good friends. This shows that little things count, and that social amenities in business life are not to be despised.

## Notes from Mexico.

### Señor Limantour's Budget.

DURANGO, December 22, 1902.—Señor Limantour, the Minister of Finance, a statesman whose views upon questions affecting Mexico's commercial and financial status always command the highest respect on account of his long experience in the important office which he holds, and his able services in contributing to the nation's fiscal rehabilitation, has just presented to the Chamber of Deputies his estimates for the year 1903-4. The minister's review of the business situation contained in his budget statement has been received with much satisfaction. It is an able and exhaustive review of all the factors which affect the country's prosperity. The deductions which Señor Limantour draws from the array of statistics embodied in his statement, while cautious and conservative, are entirely free from alarmist or even disquieting apprehension in regard to the immediate future. He estimates the receipts and expenditures for the fiscal year named thus:

| | |
|---|---|
| Normal receipts | $67,959,000.00 |
| Disbursements | 67,597,097.21 |
| Excess of revenues | $361,902.79 |

Commenting upon this presentment, the finance minister says: "It may perhaps appear that the executive has yielded to optimistic tendencies in estimating the revenue of the coming year at the figure given above at a time when a considerable depression has occurred in the value of the white metal, which will assuredly exert an adverse influence upon the yield of various taxes, and particularly on the yield of the import duties. It is true that the economical situation of the country has been suddenly confronted by a danger which threatens to check for some time its growing prosperity; but seeing that we cannot forecast the duration or intensity of this recent occurrence, the wisest course for the present seems to be to content ourselves with leaving a wider margin than usual between future disbursements and revenue without being influenced by an exaggerated spirit of despondency in estimating collections."

Some of the figures given in the statement submitted to Congress will be of interest to readers of *The Iron Age*. Here, for example, is the exhibit of imports for four fiscal years, the total value in gold being given, followed by the aggregate value in silver, showing the increase in silver value on account of the higher rate of exchange:

| Fiscal years. | Gold valuation. | Silver valuation. |
|---|---|---|
| 1900-1901 | $65,083,000 | $133,021,000 |
| 1901-1902 | 64,660,000 | 147,610,000 |
| Differences | *423,000 | †$14,591,000 |

* Decrease. † Increase.

In the statistics relating to exports, these figures appear:

| Fiscal years. | Copper. Metric tons. | Lead. Metric tons. |
|---|---|---|
| 1897-1898 | 20,367 | 58,514 |
| 1898-1899 | 32,019 | 65,004 |
| 1899-1900 | 28,266 | 68,481 |
| 1900-1901 | 33,351 | 84,959 |
| 1901-1902 | 44,972 | 98,254 |

Although optimistic in its general tenor, there are here and there expressions in the minister's statement which clearly show his appreciation of the danger lurking in the downward movement of silver, notwithstanding the little effect such movement has so far had upon the volume of the imports. This note is apparent in the following extract:

"The truth is, and it may be taken as a demonstrated fact, that, as long as the interior commerce of the republic is prosperous and the dealings in domestic products are active, the consumption of foreign merchandise is but little affected by the rise in exchange. This reflection must not, however, be taken in an absolute sense, for, though there would not be much reason for apprehension with regard to importations, though exchange were to remain for some months at the rate which it has attained, there is no doubt that in the long run, and especially if silver were to depreciate still further, the ability of consumers to purchase foreign goods would be affected by the heavy increase in prices."

### Shorter Credits.

One result of silver's fall will cause joy rather than sorrow to many United States exporters. It relates to credits. Advices from the City of Mexico say, "The wholesale merchants have met here, and on account of the great depression in silver and the continual fluctuations in exchange, have resolved to cut down the time of credit given to retail dealers from six to four months. It is understood that the retail houses will also, in turn, reduce the time of credit to their customers." Nothing is said about foreign accounts and their settlement, but the inference seems to be obvious, and an illustration of the proverb that "it's an ill wind," &c.

### Industrial Notes.

Coal mining is becoming an important industry in Mexico, and there is promise that the activity in this line of mine development will before long greatly diminish the fuel shortage in the republic. Anthracite coal is being mined in the State of Sonora by California capitalists, who control an extensive area of coal deposits. At present very little of this coal is being used in Mexico, the greater quantity being shipped from Pacific coast ports. Bituminous coal is being extensively mined in Mexico in several localities; the latest enterprise of this class is situated near Guadalajara, and C. R. Bucheit, a capitalist of Pittsburgh, is actively interested in it.

Under the title of the Monterey Coal Company, with a paid up capital of $1,000,000, and in which the governor of the State of Campeche and shareholders in the Monterey Iron & Steel Company are interested, an enterprise was set on foot in Monterey early in the month with the object of exploring and developing a large body of coal lands in the State of Coahuila.

The search for petroleum continues with activity. A new concern, the Compañia Petrolifera del Pacifico, S. A., capitalized at $1,500,000, were recently organized in the City of Mexico, "to explore and operate petroleum lands in the district of Pochutla, on the Pacific coast of the State of Oaxaca." Señor Enrique C. Creel, the rich banker of Chihuahua, and other prominent capitalists are interested in the company.

Workmen brought from Europe are continually arriving at Monterey to man the new steel plant. They will be a force of diverse nationalities, France, Germany, Austria-Hungary, Italy, Sweden and other countries having been drawn upon for labor.

A foundry under United States capitalists' auspices is to be established at Gomez Palacio, in this State.

Monterey Iron & Steel Company shares are in active demand. As much as $134 has been paid for them. The original value of these shares was $100, of which $65 per share has been assessed.

The new glass works at Monterey will soon be ready for operation. Glass blowers in Germany are under contract to work at the plant and they will soon be imported.

In November last the National Tube Company of New York shipped to this country over 1200 tons of merchant pipe.

Albert Huessener, who was very prominent in the development of the by-product coke oven in Germany, died at Essen, on November 27. He was born at Wongrowitz, Posen, in 1837, and was a mining engineer.

# The Iron Age

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## The Steel Corporation's Profit-Sharing Plan.

The announcement made last week by the United States Steel Corporation of a plan by which the employees can become participants in the profits of the company is of more than ordinary interest. So far as the mere idea is concerned of sharing profits with employees, it is by no means new. Employers have shared profits with their workmen for a great many years in various branches of trade. We have quite recently had instances in this country in which important corporations employing very large numbers of workmen have announced plans having this purpose in view. But attention is specially attracted to this matter by the commanding position occupied in the industrial world by the United States Steel Corporation. No other manufacturing concern on the globe employs such an immense number of workmen and turns out such an enormous quantity and variety of manufactured products. Every movement made by such a gigantic company is therefore invested with a great deal more importance than a similar movement by a smaller enterprise.

A careful study of the scheme, which is set forth in full detail in another part of this issue, shows that it is one of the most comprehensive and far-reaching ever devised for a purpose of this character. Indeed, in this respect it may be said to be absolutely original and unique. While the details are quite involved, they will be found to work out in every case to the advantage of the employee who continues regularly in the service of the corporation.

It will be found that two distinct propositions are stated. One enables employees, no matter in what capacity they may be engaged, to become owners of preferred stock. The other contemplates the division of a share of the profits among the men charged with responsibility in managing the affairs of the corporation, including of course the subsidiary companies.

Under the first proposition, any workingman who secures stock in the manner prescribed not only receives the dividend, but is also given $5 per share each year that he holds the stock and continues in the employ of the corporation, up to five years. At $82.50 per share, the basis fixed for the present distribution of stock, his income for the first year or so will be governed by the period he takes to pay for it, but will not be less than $8.25, or 10 per cent. on the cost of the stock as charged to him. After he has paid for the stock in full, still continuing in the service of the corporation, he receives the dividend and the extra $5 per year, which brings his income from this source up to $12 per year, or 14½ per cent. on his investment, for the remainder of the five years. But his special income from this source does not stop here, as he also has coming to him after five years a share in the fund accumulating from the forfeiture of their rights by those who quit the service of the corporation during the five years.

Under the second proposition, an officer or other employee of the corporation in a responsible position, in addition to acquiring a certain amount of stock, on the same favorable terms, receives a share of the profits depending on the total amount shown by the results of the year's business. Estimating the number of employees admitted to this privilege to be 1800, whose total salaries are about $9,750,000, and assuming that they share *pro rata*, on a basis of $90,000,000 earnings each man would receive about 10 per cent. of his salary as his share of the profits, and on a basis of $130,000,000 he would receive about 25 per cent., half of which would be paid to him in cash quarterly and the other half distributed on a plan requiring him to remain in the service of the corporation five years to receive all of it. There may be more or less than the number we have estimated who will participate in this division of profits, as the exact qualifications entitling a man to be admitted to this class of employees have not been made public. The method of division may not be *pro rata*, as that also is not stated, but we have merely made the estimate to show that the additional salary to come from this source will be quite sufficient to stimulate men in positions of responsibility to put forth their best efforts in the interest of the corporation.

The scheme, of course, enables those who earn large salaries to participate to a much greater extent in profit-sharing than the recipients of daily wages. Nevertheless, it should be attractive to the ordinary workingman, who has limited facilities for learning how he can best invest his savings so as to secure a fair rate of interest. It will be seen that the investment by the workingman in the preferred stock of the company will bring him a great deal more than the ordinary rate of interest in a savings bank. If he continues in the employment of the corporation for five years his returns on the money he has invested become still greater. The inducement to continue steadily in the service of the corporation is therefore made much stronger by virtue of this feature of the plan. This consideration naturally excites the professional labor element, who see in it a sinister scheme to impose a virtual contract on those men who subscribe for stock to continue in the employ of the corporation for five years. It would certainly not be unpleasant for the corporation if an arrangement of this kind could be secured by any plan which they could adopt. Inasmuch as any employee is able to withdraw at any time the full amount he has paid on his stock, this would certainly seem to prove that no such sanguine expectation was entertained in getting up the scheme. It seeks, however, to carry out the opinions entertained of great industrial consolidations by some of the most profound thinkers of economical and sociological questions which were advanced when industrial consolidations were first launched. They took the view that through the formation of large corporations whose stock could be purchased in the open market every workingman would have an opportunity to become a part owner in the company employing him, and would thus not only have a direct interest in its operations, but would also receive benefit from the profits which might be made.

## Public and Private Financial Relief.

Congress shows no disposition to reform the currency system, and Secretary Shaw says he expects no action. The inconveniences and occasional dangers incident to a currency inadequate and inelastic must be endured for another year.

But if the effect of liberalizing the currency laws were to provide an additional supply of money to promote speculation, the remedy would aggravate the difficulty. The Government ought to authorize credit institutions to provide an adequate credit currency, but it is none the less the duty of the credit institutions to avoid inflation and the encouragement of speculation, and this permanent obligation on the banks is especially pressing when it is certain that the annual stringency will recur next fall, and the menace of a panic will again hang over the country for two or three months.

The pendulum illustration of the alternations of prosperity and adversity is misleading. There is no law of gravity that demands this shifting of commercial conditions. Speculative periods are followed by depressions, if not panics, because losses are incurred during them, and losses disable men from investment and deter them from lending. So far as prosperity consists of a large volume of business and good—not abnormally great—profits, there is no economic law entailing a reaction. But so far as prosperity consists of advancing prices, it must come to an end, for at some point in the rise of prices of materials consumption will be checked, and at some point in the rise of the prices of securities the public will realize that the returns will not justify the purchase. A large amount of capital has been seeking investment, which has run up prices and run down returns in gilt edged securities. But besides this, there has been a great deal of buying simply in expectation of a further advance, and there is bound to be a last buyer in the series, who cannot even get his money back because belief in a further advance has subsided.

Periods of prosperity are generally followed by adverse conditions because they are accompanied by speculation, which results in losses. Securities rise above their real value, capital is invested in unprofitable enterprises, and credits are extended to persons or corporations who are unable to repay. Since the recovery from the late depression money has undoubtedly been lost, though the fact is not always realized yet, by the purchase of securities at too high prices, and the establishment of manufacturing plants which will cease to be remunerative when consumption abates. But, happily, the boom has been checked at intervals, and there is no reason to suppose that the losses have been serious on the whole. Speculation was more moderate in 1902 than in 1901, which is a remarkably favorable circumstance, for speculation usually grows till some great failure shakes the whole structure of credit, and discloses losses incurred long before, but concealed or not recognized. The comparative statistics of bankruptcies are highly encouraging as to the soundness of business.

But there is no doubt about the existence of speculation, the sales of stocks of problematical value, and a very large expansion of loans, while the higher prices rise the less room there is for them to advance still higher, and the rigidity of the currency system renders a tight money market as inevitable as the recurrence of the harvests. The era of abnormal profits is at or near its end, because prosperity has percolated through the community till it has reached the wage earners. With the decline of profits to a normal point there will be a relative decrease in capital seeking investment. The reestablishment of an equilibrium need not result in disaster; it may merely resolve a period of extraordinary prosperity among capitalists into a prolonged period of good business for every class. But this will depend in considerable measure upon the conservatism of the dominant interests in the financial world.

## The Taff Vale Decision and the British Unions.

The protracted litigation in England growing out of the strike on the Taff Vale Railroad, and involving the liability of a trade union on a claim for damages resulting from injuries inflicted by the officers and members of such union in the effort to make a strike effective, has ended in a verdict for the plaintiffs, the railroad company, on every count of the complaint. According to a curious procedure, which is, we believe, unknown in American jurisprudence, the questions submitted to the jury were divided into several specific interrogatories, which might be answered yes or no, according to the judgment of the jurors, and the judgment was rendered by the court in accordance with such findings. In this instance the questions and answers constituting the verdict of the jury were as follows:

"Q.—Did the three defendants conspire together to molest and injure the plaintiffs by unlawful means? A.—Yes.

"Q.—Did they or any and which of them unlawfully persuade the men, whose notices had not expired, to break their contracts? A.—Yes; all of them.

"Q.—Did they or any and which of them authorize and assist in carrying out the strike by unlawful means? A.—Yes; all of them."

Under the decision of the House of Lords on an interlocutory motion involving the question of the liability of unions for the acts of their members committed in furtherance of the objects of such union, this verdict was equivalent to affirming the right of the plaintiffs to the damages claimed. However, the amount of the injury suffered by the plaintiff corporation, as a measure of the damages to be awarded, was left to the court, and will be assessed when the case is reached next term. We presume there may be an appeal taken from the amount of damages assessed, but not from the question of liability, the decision of the Law Lords having decided that beyond further contention.

The reckless riding of the trade unions has ended, as might have been expected, in what in the hunting field would be called a "nasty cropper." For a great many years the unions claimed the right to exercise power without responsibility. Recognizing what was frankly admitted in the trial of the Taff Vale case, that no strike could succeed unless means were taken to make it effective which would be in violation of the law if adopted by an individual, they ordered, or, at least, encouraged and profited by, acts grossly illegal and tyrannical. When an attempt was made to call them to account they would deny any accountability. If it was shown that their officers and members committed crimes they would reply, in effect: "Well, seek the damages you claim from the persons committing the alleged offenses. They are not responsible to the extent of a brass farthing as individuals, and if the union was good for a million sterling not a penny of it could be reached until voted out of the treasury by the members." This view of the limitations of common law liability was found to have been a mistaken one. The management of the Taff Vale Railroad, which had suffered tangible damage to the extent of some thousands of pounds from the acts of the officers and members of the Amalgamated Society of Railway Servants, determined to test the question whether the injury suffered could not be adjudicated, and a judgment, if obtained, satisfied from the overflowing treasury of the union. They have found that it may be, and the victory is extremely significant.

The specific complaint of the railroad company was that the secretary of the Amalgamated, the organizing

secretary for South Wales and the West of England, and the trustees of the society had formed a conspiracy to carry on a strike by unlawful means. The details are practically the same as might be cited in the case of any stubbornly contested strike. It began with an order withdrawing some 1200 men from work at a date fixed by the officers. Many of these men broke contracts under what they considered irresistible pressure from the union. Not a few did so because threatened with serious physical injury if they did not come out with the others. Then followed the persecution of "blacklegs," illegal picketing by armed guards, who were ready and willing to maim and if necessary murder men who might seek employment as strike breakers, acts of violence, the destruction of property and the far reaching evils of the boycott. The acts charged were not seriously disputed. In view of the evidence this would have been useless. The effort of the defense was directed to showing that none of the acts charged were committed by the persons named, and that they had discouraged and discountenanced them. However, they were all part of the scheme to declare and win the strike, and were means to the end in view from which the defendants directly profited. The man who starts and maintains a bonfire in the midst of his neighbors' haystacks may not intend or wish to burn them, but if he does burn them, with great resulting damage to persons and property, his plea of irresponsibility does not usually count for much. As Mr. Justice Wills said in presenting the case to the jury: "Law courts deal with realities and not with shams. All these ingenious sophistries and shuffling of the cards and attempts to evade responsibility count for nothing in a court of justice." And so the issue proves.

How this decision is regarded in England warrants the conclusion that it is a disastrous blow to the present system of strike management. The London *Times* says: "The trade unions have again had a bad fall. The decision is one of several tending to banish cant and unrealities which long stood between the unions and the consequences of their policy." The *Telegraph* says: "It would be difficult to overestimate the importance of the verdict. We are glad to see the powerful unions reminded by this action that there are limits beyond which they cannot pass with impunity." The *Chronicle* says: "The law as now decided and administered makes it impossible for unions to strike at all without the gravest pecuniary risks. The decision inflicts the most serious blow upon the unions as fighting bodies." Indeed, there is no difference of opinion as to just what the decision means, and the only way of nullifying it is that taken by the labor leaders, who, through counsel, have drafted a bill for presentation to Parliament placing the unions in the position they thought they occupied before the House of Lords held otherwise. It may be possible to crowd such a measure through the House of Commons as an act of political expediency, but it would seem to have about as much chance in the Lords as a bill making Yiddish the court language and the authorized medium of British diplomatic intercourse. Experience has shown that the unions are not to be trusted with power divested of the ordinary common law responsibility. They abused it when they had it, and before their request for its restoration is heeded they will have to win a much larger measure of public confidence than they now enjoy.

It is impossible that the courts would be permitted to take any unfair advantage of the right to grant judgments satisfiable from the funds in the union treasuries. This would not be tolerated for a moment. If, however, the unions continue to have faith in a system of adjusting labor disputes in which success is impossible unless the laws are violated, and deem it consistent with their interests to trample upon the most obvious rights of those who oppose them, they should not plead the "baby act" when held to the same accountability as others in like case.

How the Taff Vale precedent will influence the course of judicial thought in this country is an interesting subject for speculation. Suits are already begun in which the same issues are involved, but they have not reached the stage of final adjudication, and probably will not until one of them reaches the United States Supreme Court of Appeal and is decided on constitutional grounds.

## The United States Geological Survey's Minnesota Reports.

DULUTH, MINN., January 2, 1903.—Final reports on the Vermillion and Mesaba iron ore regions by the United States Geological Survey are in the hands of the printers and will be ready for distribution some time after the new year. It is understood that when ready for the public an announcement will be made giving information where and how copies may be obtained. Requests made at present cannot be acted upon and may possibly be overlooked later.

The two monographs are separately published. Each will contain 400 or 500 pages of manuscript and each will be accompanied by general and detailed maps of the districts. That of the Vermillion will contain large scale details showing actual outcrops and drillings all along the explored portions of the range. That of the Vermillion has been written by Dr. J. Morgan Clements, assisted by C. R. Van Hise, C. K. Leith and W. S. Bailey as authors of the maps. Mr. Leith prepared the Mesaba monograph and maps, assisted as much as possible by President Van Hise. Mr. Leith has spent some five years in the Minnesota iron ore regions and has studied the Mesaba and mapped the Vermillion with the greatest care. The other members of the survey engaged in this work have been occupied for several years in a careful and detailed examination of both districts. That this work is in the highest degree important and of the utmost value, not alone from a scientific standpoint, but from its practical benefit to the explorer in the field, is conceded. I think it is recognized that in the preparation of its reports the United States Geological Survey is setting a model for similar work elsewhere, and the indications are that these forthcoming reports on these most important iron ore regions are not behind their predecessors. These reports continue the series begun with the publication, in 1892, of "the Penoke Iron Bearing Series," by Messrs. Irving and Van Hise, continued in 1897 by the "Marquette Iron Bearing District," by Messrs. Van Hise, Bayley and Smyth, and in 1899 by the "Crystal Falls Iron Bearing District," by Clements and Smyth, and will be as full and complete as those.

Actual outcroppings of areas of the Soudan—the ore bearing formation—will be materially changed from those of the preliminary report, as then noncontinuous but neighboring croppings of jasper along the strike of the formation were connected, though noted as including areas of Ely greenstone. The results of work done upon the range will be shown quite fully. The Mesaba map, a proof of which I have just seen, will extend from Birch Lake, in T 60 R 12, to and beyond to the Mississippi River, in T 55 R 25, a distance of about 90 miles. What is generally regarded by mining men as the valuable area is from the easterly side of T 59 R 14 to the west side of, perhaps, T 56 R 22, though there are some explorations still further west that may, of course, come in later. East of T 59 R 14, however, the formation is largely of magnetitic and actinolitic rocks that have not been known to carry merchantable ores wherever found. At the extreme westerly end of the mapped area the

ores are very siliceous and spread out to a considerable width without much concentration of high grade ferric oxide. As to this I speak quite generally and without reference to any particular work, and some properties may exist in that district that will be found not to have these disadvantages. Nor do I quote from the survey report or from any member thereof. While in the former map of the survey the contact of the underlying granites and quartzite with the ore bearing formation was shown quite closely, there was less definite information as to the overlying slate. In consequence locations along the strike of the range where slates had been found were frequently and of necessity hypothetically connected. Since the issuance of that map, a year ago, there has been the most active exploration all along the range, and the localities that then were somewhat indefinite have now been settled pretty closely. It is understood that the new map will show a material change from the general uniformity that characterized the upper contact in the former issue. This close mapping of the slate will be of the highest assistance to many explorers and should have a direct bearing on the prosecution of work to the south. Sections where the new map will perhaps differ more materially from former issues are in T 58 and T 59 R 15, in the Biwabik section, and around Hibbing. The nomenclature of ore properties is also much changed and the number of these is very much enlarged, mainly on account of new finds since the former map. An examination of this map on the part of those who have not followed closely the progress of exploration and development on the Mesaba will be of the utmost interest and will undoubtedly give rise to considerable astonishment.

In this latest report to be issued by the survey the amount of ore in sight upon the Mesaba has been put at probably from 500,000,000 to 700,000,000 tons, with the prevailing estimate about midway between these extremes. D. E. W.

## Indianapolis Industrial News.

INDIANAPOLIS, IND., December 30, 1902.—A review of the year's work in the iron and other industries shows that they have shared in the general prosperity, and the increase in the volume of business over that of 1901 ranges from 10 to 20 per cent. A few Indianapolis industries have been prevented from getting all they could out of the good times by a lack of capital to make necessary extensions. They are preparing to overcome that difficulty next year, which they expect to be as favorable to them as the year now closing. These concerns have necessarily had to turn down orders. So far as can be learned there have been no failures among the manufacturers here this year, and there has been about 5 per cent. increase in the number of factories.

The output of the Atlas Engine Works was about 20 per cent. greater than in 1901, and the number of men employed increased from 1138 the first week in January to 1630 the last week of December, notwithstanding delays caused by the physical reorganization of the plant. The capitalization was reorganized early in the year, $300,000 of outstanding preferred stock was taken up and $1,000,000 new preferred issued, making the total capitalization $2,000,000, including $1,000,000 of common stock. The increase was for covering an extensive plan of improvements then in progress. At that time a large boiler shop and a forge shop had been completed, and since then there has been built and put into partial or complete service foundry No. 2, for boiler fittings; foundry No. 3, for engine beds and heavy wheels; machine shop No. 3, for engine parts; pattern and storage house No. 3; erecting floor No. 3, for Corliss engines; building for cleaning castings; addition to tubular boiler shop; central power plant, and storeroom for parts. There is under construction another very large building, of which the first floor is to be used as warehouse and loading room and the second for an additional sheet iron shop. All these buildings are of stone and brick, most of them two or three stories and covering considerable area. During the year the company purchased more than 20 acres of additional land, some of which is already built upon. New equipment to the value of nearly $200,000 has been installed.

The Ewart Chain Mfg. Company have increased their output about 15 per cent. over last year. The beginning of the year found the company partly in their own plant, having for years occupied a part of the property of the Indianapolis works of the National Malleable Castings Company, who make the castings for the chain company. But it became necessary during the year to enlarge, and a four-story brick addition was built. The machinery from the old plant sufficed for the new one, little being added except a $4000 Bayley heating plant. Of the 2000 kinds and sizes of link chain belting made by the company, the latest is the silent or noiseless chain for high speed. It has been on the market only a year and the present capacity of the plant for making that particular chain is altogether inadequate to fill the orders for it. A chain that has been run 1200 to 1500 feet a minute during a year's work in the company's own shop shows no perceptible wear. The line of chains made by this company ranges from the smallest bicycle chain to chains carrying 500 horse-power. With the vacation of a part of their property by the Ewart Chain Company the National Malleable Castings Company are now using every foot of their 15 acres of ground in Indianapolis. This branch of the castings company was really an outgrowth of the chain company whose business grew so large that the Chicago malleable plant could not handle it. Now the Indianapolis branch of the castings company has outgrown its parent, the chain company, the latter taking only one-third of the volume of output of the foundry.

The Monarch Gas Engine Company will probably be reorganized early in the new year, with a capital stock of $100,000, and will add to their line the making of automobiles. As the principal stockholders live at Bloomington, Ind., it is probable the plant will be moved there and large buildings erected. The company get their chief trade from the farmers on engines from 2 to 15 horse-power.

The Parry Mfg. Company, the largest buggy makers in the world, will continue to move their plant during the coming year to the new location west of White River, where they have 26 acres near the tracks of the Belt, the Big Four and the Vandalia railroads. The company have plans for 20 brick one-story buildings of uniform size, about 90 x 400 feet. The Connersville wheel plant was moved here first, then a storeroom and paint shop for the wheels was built. This storage house for wheels is said to be the only one of its kind in the country. Its capacity is 100,000 wheels. A tire setting room has been just completed and put in operation. It is electrically equipped. The wood working department will be moved to the new site the coming year and in 1904 it is hoped to complete the removal of the old plant. The company employ now about 1200 hands, but it is their ambition to increase the number to 5000 when the new plant is in full operation and to turn out 1000 buggies, or 40 carloads, a day.

With the Jenney Electric Mfg. Company it has been altogether a question of capacity this year. This condition has prevailed to a greater or less extent since the reorganization of the plant five years ago. It is expected to result in an early increase of the capital stock and an enlargement of the plant that will double its capacity. The company have within a year or two developed a specialty, the motor equipment for printing, engraving and allied concerns. They put in 50 motors for the Chicago *Tribune*, 50 large motors for the United States Printing Company, 60 for the United States Lithographing Company and 250 for the United States Playing Card Company. The Atlas Engine Works' order for this year was 70 motors, of which three were of 30 horse-power and eight of 15 horse-power. Owing to the crush of domestic orders the export trade has been left to take care of itself, but Australia sent for 50 motors of the smaller sizes and a fair trade was done in England.

The Indianapolis Belting & Supply Company have found 1902 to be the best year for business since they began, 14 years ago. Three of their largest recent orders were $500 jobs for the Hoosier State Flour Mills, Indianapolis; the Crawfordsville Wire & Nail Company and the Montgomery Lumber Company, Crawfordsville.

Indiana is the company's principal territory. The company say that manufacturers think a long time before abandoning leather belting for other kinds in plants already equipped. Prices continue high.

The Lindsay-Russell Company have met with gratifying success since their organization in June last. They took the main floor of the new brick building at South and Missouri streets, which gave them floor space 40 x 200, but business increased so rapidly that they have leased the second floor also. They manufacture automobile rear axles and complete running gears for electric and gas wagons. There are few, if any other, factories in the West making parts and gears exclusively, and the idea has taken well. The company have established trade already in Ohio, New York, Illinois, Minnesota, California, Canada and Australia, as well as in their own State. They turned down orders from Japan and Brazil because of the weight of the gears ordered. The company's standard gear for gasoline wagons weighs 450 pounds, and for electric wagons 400 pounds, though they make the latter as light as 280 pounds without the tires. They also build complete runabout wagons, but give this department little attention. The orders got beyond their capacity. The additional machinery needed has not yet been purchased.

The Indianapolis Staple & Tack Company will go into new and enlarged quarters at Alabama and South streets February 1. The company were organized in March by Frank Latty and Geo. H. Evans, and began manufacturing in May. They make single and double pointed tacks and staples, the double pointed being their largest output. The capacity on these is 2½ tons a day. Beginning with four machines they doubled the number and will add 15 new ones. Their double point tack machines are their own invention and make. They have not closed contracts for the other machinery needed, including a few special nail machines. The company claim to be the largest makers of these goods in the West and make a specialty of filling orders for odd sizes. Their product goes into the Western States, Cleveland being the furthermost eastern point served.

The M. E. Howard Machine Works, making small vertical engines their specialty, report progress in their trade, in harmony with the general advance throughout the country. The leader is an 8 horse-power engine, but 5 and 15 horse-power are also made largely here. Mr. Howard began his business 15 years ago, when he could afford to buy material for only one part at a time. In addition to the home trade orders have been filled recently for Yokohama and Canada. Some of the engines went into the Alaska gold fields, the freight being double the original cost of the engines. The capacity of the plant is 150 engines a year. Mr. Howard feels the trend of events in the division of industries in that he has given out his first order for a part of the engine —connecting rods. Heretofore he has made in his shop every part of the engine.

The Enterprise Foundry & Fence Company, the new name for the firm of Ellis & Helfenberger, made the unusually large increase of 60 per cent. in their business in 1902, over the preceding year. This was partly due to general conditions and partly to specially energetic efforts. Their public work—cemetery, college, court house and school fences—exceeded their private work. Their court house fence trade is mainly in the West and South, the other is well scattered over the entire country. The company enlarged their foundry during the year. Of six to eight similar plants in this city in the booming fence times, six or seven years ago, the Enterprise is the only one left. It is the largest in the State, although its competitors are few. The company find an unexplainable difficulty in closing foreign contracts. *The Iron Age* brings a multitude of requests for catalogues and other communications from foreign countries and from exporting agents at New York. They figure low on prospective foreign jobs, but get few of them. The company would like to know what is the matter with the foreign buyers.

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J. Van Vleck has retired from the firm of Phelps, Dodge & Co., New York, owing to ill health.

## Central Pennsylvania Industrial News.

HARRISBURG, PA., January 3, 1903.—The Pennsylvania Steel Company are working with a limited supply of fuel, and there is a possibility of the entire works, employing over 8000 men, being closed next week unless coal arrives. The company have plenty of coal at the mines, but are unable to secure its prompt delivery at the works, and during the year 1902 two whole months of idleness were experienced on this account. The output for the works at Steelton during 1902 was 452,500 tons of steel, 237,500 tons being Bessemer and 215,000 tons open hearth. This breaks all records for production at these works. Ten years ago the mills produced in 12 months only 229,291 tons of steel. Large orders have been received which will keep the company busy during 1903, and will increase the output.

President Fleming of the Harrisburg Foundry & Machine Company has started the new year with unusually large orders. The Pittsburgh Coal Company have ordered two 400 horse-power engines. This is the twenty-fourth order from the Pittsburgh Company. The Carolina Steel Company of Burlington, N. C., have ordered one 250 horse-power engine, and Smith & Nixon, piano makers, of Cincinnati, Ohio, a 200 horse-power engine. President Fleming said, in a forecast of the coming year: "Unless all signs fail 1903 will fully maintain, if not surpass, the year just passed, which was by far the best we ever experienced. The foundry and machine works has already orders to keep all hands busy for four or five months. The installation of new machinery during the next two or three months will greatly increase the capacity of the plant and enable us to handle all orders promptly."

Boll Bros., manufacturers of metal beds and bedding, this city, on December 30 put in operation a new foundry for the making of all the brass and iron castings to be used by the local works.

The capacity of the Lucknow Forge, west of Harrisburg, has been increased by the addition of one heating furnace and two forge fires. The forge had a larger output last year than during any year of its history, save one.

The Chesapeake Nail Works of Harrisburg have been closed since before the Christmas holidays, on account of a scarcity of coal. The works will resume operations some time next week, it is expected.

During 1902 the Cliff Locomotive Works, a subsidiary company of the American Locomotive Company, at Scranton, turned out 122 locomotives, and orders on hand indicate the the coming year's business will be even greater.

Several departments of the Standard Steel Company, at Lewistown, Mifflin County, were closed this week, on account of lack of coal.

The Wrightsville Hardware Company, at Wrightsville, have been closed for a week and a half taking account of stock and making preparations for an enlargement of the plant during the coming year. The company have had a very prosperous year and broke all records for production. Three months' orders have been booked for the new year.

The Aurora Furnace at Wrightsville has been banked on account of shortage of coke. The company have but little iron on hand and many orders unfilled.

The fuel situation among the industrial establishments at Reading has reached an alarming stage, and if a supply of coal is not soon received many of the plants will be compelled to suspend. During the busy season there has not been a furnace in the district that has not been compelled to lay off from one to three weeks on account of lack of fuel. The Sheridan Furnace was to have started this week, but the management were unable to make a contract for coal.

The Lackawanna Iron & Steel Company have purchased 35 acres of land in North Lebanon township for $29,375, to add to their Colebrook Furnace plant.

Robert C. Neal of Harrisburg, a director of the company, made an inspection of the Eleanor iron plant at Hollidaysburg this week, and it is reported will recommend its enlargement during the coming year.

The Altoona Citizens' Electric Light, Heat & Power Company have awarded a contract to the Erie City Boiler & Machine Company for the engines and boilers to be used in the equipment of their new plant. The contract calls for four tubular boilers of 300 horse-power each and three engines of the four-valve type of 350 horse-power each.

Charters were issued at the State Department during the past month to the following corporations:

The Williamsport Gas Engine Company, Williamsport; capital, $21,000. Directors: H. D. Brown, C. V. Brown, C. E. Long and John K. Hayes, all of Williamsport.

The Newlin-Knight Hardware Company, Philadelphia; capital, $60,000. Directors: T. C. Nesbitt, Jr., George Greening, W. E. Dowler, Philadelphia: H. R. Knight, Jenkintown; W. H. Jones, Norristown.

The Hayward Foundry & Machine Company of Monongahela City; capital, $2500. Directors: James B., George, Harry, S. L. and J. B. Hayward, Jr., of Monongahela City.

The Chambers Hardware Company, Oil City; capital, $50,000. Directors: Fred. A. Chambers, O. H. Strong, H. M. Nichols, E. V. D. Sellers, J. F. Weaver, S. Reed Bennett and F. G. Parks of Oil City.

The Economy Pressed Steel Feed Company of Pittsburgh; capital, $10,000. Directors: A. R. Bingham, T. H. McFeeters, O. E. Hallem, J. O. Bair and W. G. Carkwright of Pittsburgh.

The J. H. Johnson, Jr., Company of Philadelphia, for manufacture of iron products; capital, $300,000. Directors: Israel H. Johnson, Joshua R. Johnson, Washington B. Gilpin, Howard Casper Johnson and Robert P. Ross, Jr., of Philadelphia.

The Pittsburgh Safe Company, Pittsburgh; capital, $1000. Directors: A. B. Gaehler, Charles G. McKee and E. G. Wolfram of Philadelphia.

The Custer Beam Works of Philadelphia; capital, $5000. Directors: Charles L. Weisheit, George S. Stewart and William S. Atchison of Philadelphia.

The McCoy-Sinn Iron Company of Bellefonte; capital, $20,000. S.

## The Great Lakes Engineering Works.

Announcement is made that the Great Lakes Engineering Company, Detroit, Mich., will reorganize under the name of the Great Lakes Engineering Works with a capital of $1,500,000 and a bond issue of $500,000. The company propose to begin at once the erection of a large shipyard for the construction of modern steel vessels at a site just below the city on the Detroit River. Another important undertaking contemplated is the construction of an immense floating dry dock large enough to handle the biggest vessels now afloat on the lakes.

The plant will occupy a tract of 85 acres on the river front, with a frontage of 1400 feet. There will be four shipbuilding berths 600 feet in length, and the yard will be equipped to build simultaneously four of the largest vessels ever planned for the lakes. It is expected that the buildings and docks will be completed by spring.

The officers of the company are Antonio C. Pessano, president and general manager; George H. Russel, Detroit, vice-president, and John R. Russel, secretary and treasurer. Among the principal stockholders are H. W. Hoyt, second vice-president of the Allis-Chalmers Company, Chicago; H. B. Ledyard, president of the Michigan Central Railroad; W. G. Mather, Cleveland, president of the Cleveland Cliffs Mining Company; I. W. Frank, Pittsburgh, president of the United Engineering & Foundry Company; O. P. Letchworth, president of the Pratt & Letchworth Company, Buffalo, and W. D. Sargent, New York, president of the American Brake Shoe & Foundry Company.

**New Machine for Dressing Belts.**—A new device for applying dressing to leather belts is being introduced by the Richart Mfg. Company of Scranton, Pa. It consists of a roller at the end of a case, into which a cake of dressing is inserted and is kept in place by a spring follower, which keeps the cake of dressing in contact with the roller at all times. When the moving belt engages the roller it causes it to revolve rapidly and rub against the cake of dressing on the inside of the case. By this means the dressing is applied to the belt very evenly and quickly.

A list of the mines of the Newport Sand Rank Company of Newport, Ky., published last week erroneously included Coldwater, Ill. It should read Waterford, Ill.

## Trade Publications.

**Conveying Machinery.**—An interesting catalogue by the Steel Cable Engineering Company of Boston deals with their conveyors of various types. Their driving mechanism produces an absolutely constant and even motion of the conveyor with any length pitch of chain. This driver consists of inside and outside cams, made of steel, and bolted to cast iron webs which are, in turn, keyed to the driving shaft. Suspended in suitable bearings are two pairs of pushing arms which are driven forward by the cams. In the forward ends of these pushing arms are rollers which roll against the track wheels in the chain when the pushing arms are being driven forward. As soon as either cam has driven its pair of arms the required distance the arms automatically return to their first position and the cams are so arranged that one pair of arms is always pushing so that there is never let up in the motion of the conveyor. The roller in the end of the arm, which comes in contact with the track wheel, prevents any uneven wear of the wheel or itself on either surface, owing to their constant turning, so that there is no liability of a change of pitch in the chain and driving arms due to wear.

**Barrel Machinery.**—A complete line of barrel machinery is manufactured by the Clough & Witt Machine Company of Cleveland, Ohio. The appliances consist of chamfering, leveling and crozing machines, friction driven trussing machines, adjustable setting up forms, hoop nailing forms, slack barrel heaters, &c. The friction power windlass for hooping is operated by a foot treadle, leaving both hands of the operator free to handle the cable and truss hoops. As the cable is drawn from both ends at the same time the annoyance of having the barrel roll during the operation is avoided.

**"Underground Wire Rope Haulage"** is the title of an illustrated article by the Broderick & Bascom Rope Company of St. Louis, Mo., describing the successful application of wire rope haulage in the workings of the Coal Valley Mining Company at Sherrard and Cable, Ill. The article is presented in the form of a pamphlet on heavy paper of fine quality, measuring 9 x 12 inches. The tail rope system has been in operation in these mines for 20 years, but a number of years ago it was abandoned in the Cable mine as incapable of further output on a paying basis, under old methods. A modern tail rope system extending into the workings for 1½ miles was the means of immediately doubling the output at one-half the cost of the old operations. Now the mine is being drawn and the haulage system extends about 5500 feet along the main tunnel. A feature of this tunnel is the heavy grades which in places reach a pitch of 10 per cent. The main rope is 1 inch in diameter, the tail rope ¾, and both are of six strands, with 19 wires to the strand, with a hemp center. The hauling machinery is above ground, the ropes running over sheaves down the shaft and into the tunnel.

**Power Transmission Machinery.**—Complete water, steam and electrical plants are designed and equipped by the James Hunter Machine Company of North Adams, Mass. A catalogue by them illustrates a method for the transmission of power by means of a main receiving or driving pulley mounted upon a quill or hollow shaft through which the main shaft passes, being connected to the quill by a friction clutch. The clutch is operated by a geared shipper attached to one of the floor stands supporting the quill. The bearings for quill and shaft are of the ring oiling, ball and socket type, supported in floor stands permitting vertical and horizontal adjustment.

**Mill, Machinists', Railroad Supplies, &c.**—A bound volume of over 650 pages has been received from the Pittsburgh (Pa.) Gage & Supply Company, who are contracting engineers for steam power plants complete in every detail. The product is composed of pipe, fittings, valves, gauges, injectors, oilers, belting, forges, drills, pipe tools, taps, dies, reamers, bolts, nuts, foundry supplies, wire rope, lifting jacks, hangers, pulleys, sheaves, manila rope transmissions, elevating and conveying machinery, boilers and engines. A copious index provides means for ready reference.

**Bolt and Nut Machinery.**—An attractive catalogue has been gotten out by the Acme Machinery Company of Cleveland, Ohio. The Acme bolt cutters have four dies to each set, made of market size tool steel, carefully ground to standard gauges and made to fit the hardened tool steel bushings in the die head. Being plain in shape they can be made in any machine shop by an ordinary mechanic at a trifling cost. The Acme six-spindle nut tapper is suitable for tapping ¾ to 1 inch, either square or hexagon nuts. This machine has adjustable nut holders and quick acting sockets. The taps can be removed and replaced while the machine runs at full speed, or each spindle may be stopped at will. Each pair of spindles runs at different speeds, but can be arranged to run at one speed if desired.

Under the title "Disc Grinder Facts" the Bayldon Machine & Tool Company of Jersey City, N. J., have prepared a pamphlet explaining what a disc grinder will do. It

is stated that steel discs covered with emery paper are the most rapid cutting of all grinding devices so far invented, as their cutting speed is twice that at which any emery wheel can be safely revolved and their surface always remains true.

The Emerson Electric Mfg. Company, 714-718 St. Charles street, St. Louis, Mo., are distributing a very useful desk calendar, having a separate leaf for each day of the year, with space for memoranda. It is mounted on a steel stand.

The American Bridge Company of New York, 100 Broadway, New York, are favoring their customers with pocket diaries of exceptional value. Double the usual space is furnished for daily memoranda, but thin paper of high quality is used, which avoids bulkiness. Much information of value to business men is incorporated in the book, including miniature maps of American countries and United States possessions.

# MANUFACTURING.

### Iron and Steel.

Materials for construction and machinery for operating the coke ovens they propose to build will be required by the Columbus Iron & Steel Company, Columbus, Ohio. The company have purchased the Raven Coal Company, whose properties are located on the Kanawha & Hocking Railroad, in West Virginia. The output of the mines is between 500 and 600 tons of coal a day, and the steel company will erect a sufficient number of ovens to supply their furnaces with coke.

Duquesne Furnace No. 4 of the Carnegie Steel Company, at Duquesne, Pa., which has been idle for some time for relining and other repairs, was blown in again last week. The match was applied to the furnace by the daughter of Azor R. Hunt, general superintendent of the Duquesne Steel Works and blast furnaces. This furnace is in splendid shape and is expected to turn out an average of 600 tons of iron or more per day.

All the mills of the Youngstown Iron Sheet & Tube Company, at Youngstown, Ohio, are now in full operation. The last department to get started was the new skelp mill, which was put in operation last week. The pay roll of the company amounts to about $80,000 per month. The output consists of iron sheets and iron tubes.

The new plant of the Fort Pitt Spring & Mfg. Company, at McKee's Rocks, Pittsburgh, will begin operations this month. The plant will have a capacity of about 1500 tons of springs per year, but it is probable the output will be materially increased later in the year.

Haselton Furnace of the Republic Iron & Steel Company, at Haselton, Ohio, has been started up after a long shut down for repairs and also for want of coke. Haselton rolling mill of the same concern has been started up, the puddling mill resuming operations on Monday, January 5, and the finishing mills a few days later.

The schedule of liabilities and assets of the Ohio Rolling Mill Company, Findlay, Ohio, was filed in the courts last week. The liabilities were given as $35,293 and the assets $60,753.36.

The Cleveland Cliffs Iron Company of Cleveland, Ohio, are reported to be investigating an acreage on the river front at Toledo with a view of establishing a blast furnace and sheet mill. Options on considerable property are said to have been taken, but the matter is still in an undecided state and the Cleveland people are as yet unwilling to discuss it. The Cleveland Cliffs Iron Company are among the largest producers of ore in the country. Last year they brought down from Lake Superior 1,800,000 tons of ore.

The Norwalk Steel & Iron Company, who are completing a large steel plant at Norwalk, Ohio, are back of a project to establish a steel castings plant in that city. Plans are under consideration for a main building from 200 to 300 feet long and from 60 to 100 feet wide, together with necessary auxiliary buildings. A site of sufficient size to accommodate large additions has been secured, and it is announced that the plant will be erected during the coming summer.

### General Machinery.

Roberts, Tatem & Co., recently organized, have leased the Thomas Iron Works, Berkley, Va., and after a number of improvements to the plant they are prepared to turn out first-class work.

The Minster Machine Company, Minster, Ohio, have purchased some special machinery to enable them to take care of their increasing business. The company recently began the manufacture of plain pulleys, a clutch for attaching wood pulleys, and ornamental urns for lawns, parks, &c.

The Miami Valley Machine Tool Company, Dayton, Ohio, are receiving a great deal of encouragement on their new 13½-inch by 6-foot engine lathe from both dealers and users, and have disposed of one-half of the first lot of 12 lathes which they are at present building.

The Palfrey Foundry & Machine Works, Macon, Mo., will erect a new plant near Kansas City. They are preparing to take up the manufacture of a number of new specialties, including a steam boiler tube expander, coal car, trucks, store, pantry and closet shelving, upon all of which Mr. Palfrey has been allowed patents. Outside territory for the patents will be on sale.

S. D. Warren & Co. have recently bought three induction motors, two of 100 horse-power and one of 150 horse-power, from the Westinghouse Electric & Mfg. Company, to be installed in their paper mill at Cumberland Mills, Maine. The two 100 horse-power motors will be used for driving blowers furnishing mechanical draft, and the 150 horse-power motor will drive paper making machinery of various kinds.

It is announced that the Phœnix Iron Works, at Winona, Minn., are to be offered for sale by the executors of the estate of Wm. M. Hulbert, who for 30 years was the proprietor of the plant. Since the death of Mr. Hulbert the executors have continued to conduct the business and will continue to do so until the plant is sold.

The Diamond Iron Works, Minneapolis, Minn., have been incorporated with a capital stock of $100,000. The indebtedness which may be incurred by the company is limited to $50,000. The company will manufacture various kinds of machinery. The incorporators are H. H. Smith, president and treasurer; Roy B. Smith, vice-president; Edward F. Melony, secretary; Julia P. Smith and H. G. Dittbenner. One building which will be used as a foundry is already under construction. Other buildings will follow.

The report that the Saco & Pettee Machine Shops, Biddeford, Maine, would enlarge their shops at once is denied. There is no doubt, however, that the plant will be materially enlarged before the end of the year, the proposed additions being a machine shop, 70 x 600 feet, and a power house, 40 x 100 feet.

The Fire Department, New York, will erect a three-story brick repair shop at Twelfth avenue and Fifty-seventh street, covering a plot 56 x 352 feet.

The Webster, Camp & Lane Company, Akron, Ohio, builders of Akron Corliss engines, mining machinery, coal and ore handling machinery, are equipping 42 ore unloading machines at Lake Erie docks belonging to the Pennsylvania Railroad and M. A. Hanna & Co., with Hulett automatic unloading buckets. The unloading machines to which they are being attached are of the Brown and King Bridge type, which are at present equipped with hand filled buckets. There are 12 of them in Cleveland belonging to the Pennsylvania Railroad, 12 in Ashtabula belonging to M. A. Hanna & Co., 12 in Erie belonging to the Pennsylvania Railroad, and six in Buffalo belonging to M. A. Hanna & Co. The same concern are rebuilding two additional unloaders for the Cambria Steel Company, Johnstown, Pa.

At Pittsburgh the partnership heretofore existing between Charles R. Dallas and Guy P. Thurber, under the firm name of Pittsburgh Engineering Company, has been dissolved, Charles R. Dallas having sold his interest to Guy P. Thurber, who will continue the business under the same name as heretofore.

The Dayton & Muncie Traction Company of Dayton, Ohio, through E. P. Roberts & Co., Cleveland consulting engineers, have placed contracts for the equipping and building of 45 miles of electric road in Ohio and Indiana. The Westinghouse Electric & Mfg. Company will furnish the entire electrical equipment for power house, substations and rolling stock, the largest items being two 500-kw alternating current generators and five 200-kw. rotary converters. The Buckeye Engine Company, Salem, Ohio, will furnish two 750 horse-power cross compound condensing engines, and the boilers will be furnished by the Stirling Company, Barberton, Ohio. The auxiliary steam equipment and piping will be furnished by the Shone-Kendall Company, Toledo. The Chase Construction Company of Detroit will be actively in charge of the work of building the road.

The Sherwin-Williams Paint Company of Cleveland have placed a contract with the Westinghouse Electric & Mfg. Company of Pittsburgh for electrical equipment aggregating nearly $500,000, to be placed in their various manufacturing plants throughout the country. For the Cleveland plant three large generators and a number of induction motors will be installed, and at the Newark, N. J., plant a generator and a number of motors. At Pullman, Ill., two generators and a number of motors will be installed.

The C. O. Bartlett & Snow Company of Cleveland have secured a contract from the Ironville Dock & Coal Company, Toledo, Ohio, for the erection of a vessel fueling outfit to have a capacity of 500 tons of coal per hour. The coal is dumped into a large hopper and is loaded into any portion of a boat by means of a shifting spout.

The National Coal Burner Company, Toledo, Ohio, are shortly to be incorporated to manufacture the Howe feeder system for burning powdered coal. This system has been placed in operation in the plant of the C. O. Bartlett & Snow Company of Cleveland, and it was thoroughly described and illustrated in a recent issue of *The Iron Age*. John Kirschner & Co., Toledo bankers, are promoting and financing the project, and it is the intention to erect a large plant to manufacture the outfits.

The Carlyle-Johnson Machinery Company have organized at Youngstown, Ohio, with a capital stock of $100,000 for the manufacture of tools, &c. The incorporators are M. Carlyle

Johnson, George W. Upton, John Stambaugh, H. H. Stambaugh and H. M. Robinson.

**Boilers, Engines, &c.**

W. P. Walsh, of Grundy Center, Iowa, has been granted a franchise for an electric light and power plant by the city of Reinbeck. The plant will be operated by steam power, will have a capacity of 25 2000 candle-power arc and 1200 16 candle-power incandescent lights, and will cost complete about $12,000. The equipment will consist of 150 horse-power Corliss engine and horizontal tubular boilers, direct connected generator and motors, and one geared head deep well pump for city water. Bids will be received January 10 for engine, boilers and generator. Mr. Walsh at present is superintendent of the Grundy Center Electric Light, Heat & Power Company.

The Bauer Machine Works, A. F. Bauer, proprietor, Kansas City, Mo., manufacturers of gas and gasoline engines, have incorporated with a capital of $5000 as the Bauer Machine Works Company. The new company have purchased a plot of ground on West Eighteenth street, where they will erect a building 50 x 100 feet, two stories. No new machinery will be installed at present, but next summer some will be added. A. F. Bauer is president.

The Williamsport Gas Engine Company, Williamsport, Pa., were incorporated to succeed the Longtine Gas Engine Company in the manufacture of gas and gasoline engines. The company took charge of the plant in November, but have lately moved into larger quarters, where they will continue the manufacture of the Longtine type of engine in sizes 1, 3½, 5 and 10 horse-power.

Piping, shafting, &c., are required for the new power house to be built at mill No. 2 of the Naumkeag Steam Cotton Company, Salem, Mass. A 1500 horse-power cross compound engine will be installed which will transmit power by rope drive into the various floors. Lockwood, Green & Co., engineers, 93 Federal street, Boston, who have the matter in charge, advise us that the contract for the engine only has been let. The company also contemplate a similar improvement at their mill No. 5.

Having just passed through the most successful business year since the organization of the company, the Waterloo Gasoline Engine Company, Waterloo, Iowa, are about to reincorporate and increase their capital stock from $40,000 to $150,000. The new management will include the consolidation of the Waterloo Gasoline Engine Company and the Davis Gasoline Engine Company into one company, to be known as the Waterloo Motor Works. The product of the new company will be a full line of automobiles, stationary, portable and pumping gasoline engines.

The supervisors have been considering a resolution appropriating $10,000 for a new power house and boilers at the County Court House, Herkimer, N. Y.

The Water Works Department of Sandusky, Ohio, are installing a 10,000,000 gallon pumping engine built by the Holly Company of Rochester, N. Y.

About 100 boiler makers employed in the plants of the Forest City Boiler Company, the Union Machine & Boiler Company, H. E. Teachout and the Lake Erie Boiler Company, Cleveland, Ohio, went on strike last week demanding a nine-hour workday. The men are largely engaged in marine boiler repair work, and many of them made a similar attempt to gain a shorter workday in a strike last winter. At that time the strike interfered seriously with marine repair work, but the indications are that the present strike will be speedily settled.

It is stated that bids are asked until January 15 for constructing pump house and equipment, including pumps, boilers, water tank, trestle and extension of mains, at Fort Snelling, Minn. George E. Pond, chief quartermaster, St. Paul.

The Home Brewing Company, Toledo, Ohio, have placed a contract with Huefteman & Cramer of Detroit for the erection of a brewery to involve the expenditure of about $150,000. A 150 horse-power engine, two 150 horse-power boilers, two 50-ton ice machines, two steel grain bins with elevating machinery, storage tanks, air pumps, brew ketties and other equipment will be required.

The Cleveland & Sandusky Brewing Company of Cleveland, Ohio, will make extensive improvements and additions to their East End brewery, and will install new engines, boilers, ice machines and other equipment.

**Foundries.**

The Torrent Pump Company, recently incorporated, have taken over the plant and business of the Torrent Pump & Fence Company of Cleveland, and will continue the manufacture of pumps for wells and cisterns in a new plant they are building in Sebring, Ohio, and which they hope to occupy within a few days. The officers are: George E. Sebring, president; F. A. Sebring, vice-president; I. K. Hurt, secretary; W. H. Sebring, treasurer, and C. N. Ogle, superintendent.

The Price & Evans Foundry Company, Chattanooga, Tenn., have incorporated. It is their intention to make some minor improvements to the plant and later in the year it is probable a substantial addition will be erected.

The Oil Well Supply Company of Pittsburgh are filling a large order for pipe for export to Sumatra. The order is said to amount to 900 tons of 3 and 9 inch line pipe and will be used for oil development in the east coast of the island.

The plant of the Wilkes Foundry Company, Toledo, Ohio, will be extended 100 feet and in the spring a foundry, 110 x 250 feet, will be built which will be used for light work and will be equipped with molding machines.

The American Pin Company, Waterbury, Conn., will build a new foundry, 62 x 162 feet. The Torrington Building Company have the contract.

The Mansfield Engineering Company, Mansfield, Ohio, have broken ground for a new foundry. It will be of brick and steel, 75 x 175 feet, and will be covered by a 25-ton electric traveling crane. The foundry will be in shape by April 1, and thereafter they will make all their own castings. They are also erecting a new power house in which will be installed an engine, generator, air compressor and boiler. The building is designed for an extension which will be erected this year, and at that time two more boilers and engines will be installed.

The Fair Foundry Company, Knoxville, Tenn., advise us that trade with them last year was better than in any previous season. They have bought more land and purpose making some additions to the plant in the way of buildings and new machinery. The company make a line of stoves which they sell entirely to the local jobbers, and also do a general foundry business.

The Twentieth Century Heating & Ventilating Company, successors to Clerkin & Maag of Akron, Ohio, are enlarging their foundry to double its former capacity and contemplate during the coming season the erection of one and perhaps two large warehouses in the Central West. The company have in preparation a new catalogue which they expect to distribute among the trade early in the new year.

F. & L. Kahn & Brothers, Hamilton, Ohio, manufacturers of the Estate stoves and ranges, advise us that they have now in course of construction and near completion a new foundry which will give them an increased producing capacity of 40 per cent. They are also building an additional manufacturing shop 60 x 180 feet, five stories high, and a power plant, with a new building for japanning, galvanizing and tinning. They have recently completed the installation of electric lighting in the plant.

The Toledo Castings Company of Toledo, Ohio, has awarded a contract to Frank Stahl for the erection of their new foundry at East Toledo. The building will cost about $ 0,000 and work will start at once.

**Fires.**

The Kennilworth brick works, across the river from Wellsville, Ohio, and owned by Park Bros. of Pittsburgh, were destroyed by fire January 3. The loss will reach $25,000.

The plant of the Charles Abresch Company, carriage manufacturers, Milwaukee, Wis., was destroyed by fire December 31. The loss is upward of $100,000.

Fire did $5000 damage to the plant of the Columbus Bolt Works, Columbus, Ohio, December 30.

The factory of the Stoughton Mills Company, Stoughton, Mass., was destroyed by fire January 1. The loss is about $35,000.

It is stated that a large amount of machinery was lost in the fire which destroyed the grain elevator of the Great Western Cereal Company, Fort Dodge, Iowa, entailing a loss of $100,000.

The plant of George B. Freeman & Co., manufacturers of bits and bolster springs, Racine, Wis., was destroyed by fire December 23, causing a loss of $20,000, on which there was an insurance of $5000. It is supposed that the fire originated from an explosion of gas in the engine room.

Morris & Lewis' foundry, known as the Rock Island Iron Works, Rock Island, Ill., was destroyed by fire December 31. The loss is placed at $40,000.

**Hardware.**

G. & H. Barnett Company, Philadelphia, have under way at the present time plans for a new grinding shop, approximately 50 x 200 feet, and a new engine house, with 700 horse-power engine. This is referred to as double the capacity of the largest of their present engines.

General Foundry Company, Gardner, Mass., manufacturers of gray iron, brass and composition castings of every description, have so much outgrown their present quarters that they contemplate making an addition to their plant as soon as the frost leaves the ground in the spring.

Richardi & Bechtold, Bellaire, Mich., manufacturers of woodenware specialties, kitchen, dairy, bakery and confectionery utensils, are about ready to start up for the season, after having thoroughly overhauled and improved the plant.

The American Mfg. Company, Arlington Heights, Ohio, have closed their factory for a period of two or three weeks for the purpose of making extensive repairs and putting in more machinery to meet the rapidly increasing demand for their Sprung washing machine. The output of this washer during 1902 more than doubled that of last year, and the company are expecting to make an even better record during 1903.

The Griffin Mfg. Company, Erie, Pa., are building a new power house and installing two 100 horse-power return tubular boilers and a Corliss engine to match. As soon as they can get

the new plant going they will move their old boiler and engine into the new building, giving them considerable additional manufacturing space.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., have just completed their No. 3 factory, 100 x 110 feet, which will add 25 per cent. to their capacity. The building is seven stories. The first floor is used for the storage of raw materials and as a shipping room; the second and third floors are devoted to the manufacture of porcelain lining for refrigerators; the fourth floor is devoted to packing and crating refrigerators, and the fifth, sixth and seventh to storage. The two upper floors are 19 and 20 feet in the clear, giving double the amount of storage on each floor.

Bay State Stamping Company, Worcester, Mass., manufacturers of Bennett pedal ferrules, bicycle parts, &c., have moved into a larger and more modern plant, where they are in excellent position to meet the requirements of their growing business.

The Robin Hood Powder Company, Swanton, Vt., have during the past four months increased their output to more than three times their capacity on January 1, 1902, which is indicative of the rapidly increasing demand for Robin Hood smokeless powder and factory loaded ammunition. They are expecting still further to increase their capacity during the coming spring.

Fitchburg File Works, Fitchburg, Mass., who make an extensive line of hack saw blades and files, have recently added to their factory an adjoining building which will be used principally to extend their manufacturing facilities in the hack saw blade line, the business of which department has very largely increased. The new building will give them 24,000 feet additional floor space, all of which will be available for manufacturing purposes.

Monitor Drill Company, Minneapolis, Minn., several months since increased their capital stock from $200,000 to $1,000,000. The company are now preparing plans which will double the output on their double disk drill, for which they have had an especially large demand.

The capital stock of the Findlay Axe & Tool Company, Findlay, Ohio, has been increased from $40 000 to $50,000.

John D. Ma[illegible]nd A. C. Blinn have taken over the plant of the Cranda[illegible]nce & Iron Company, Sandusky, Ohio, and will probably enlarge it during the summer. The present plant is 56 x 96 feet, and included in the transfer is a site of 66 x 200 feet.

**Miscellaneous.**

The plant of the Youngstown Car Mfg. Company, at Youngstown, Ohio, recently purchased by George T. Oliver and other capitalists of Pittsburgh, was put in partial operation on Monday, December 29. It is the intention to greatly enlarge this plant and make both wooden and steel cars, and contracts for new buildings and equipment will be placed in a short time.

The Keasbey & Mattison Company, Ambler, Pa., manufacturers of magnesia felts, pipe and boiler coverings, asbestos building papers, &c., have under consideration the erection of a large plant in the vicinity of Milwaukee, Wis.

Press dispatches from Nashua, N. H., state that arrangements are under way for a combination of all the large independent brick-making plants. It is proposed to capitalize the new corporation for $5,000,000 and to build several new plants.

The Atlantic Macaroni Company, New York, have purchased a site in Long Island City where they will erect a large plant, removing their works from Newark and Manhattan to the new location as soon as the buildings are ready, which will be within a year.

The Wilson Steel Range Company have just been organized at Belleville, Ill., with a capital stock of $50,000. The new plant will be located in what is known as the West End, in the neighborhood of the Eagle Foundry. Work on the necessary buildings is under way and it is the expectation that the plant will be in running order about March 1. The officers of the company are: President, James Wilson; vice-president, William Schlott, and secretary and treasurer, Gotlieb D. Klemme.

The entire manufacturing plant of the Rutland Fire Clay Company, at Rutland, Vt., was destroyed by fire on December 14. The loss is partially covered by insurance. The company advise us that they have arranged for temporary quarters to enable them to carry on their business until they can make arrangements for rebuilding, which they will probably do in the spring, putting up larger and more substantial structures than those destroyed. They have received the necessary supplies to be used in taking care of their present orders, and are making every effort to get new machinery for grinding in place. The company expect to be able to begin shipping on the orders that have accumulated by January 1, after which they will be able to take good care of all their business. The company are large manufacturers of fire clay, fire brick, stove and range lining, sewer pipe, stove putty and stove polish.

The Toledo Machine & Tool Company, Toledo, Ohio, have an order for the dies, stamps and other machinery for the manufacture of a new type of radiator, to be made by a new company of whom Guy Major is the head, and which it is said will be capitalized with $5,000,000. The radiator is to be manufactured under the patents of C. E. Safford of Buffalo, N. Y. It is made of pressed steel, is only about one-third the thickness of the cast radiator and is said to have one-third more radiating power, while it can be constructed at about one-half the cost of the radiators now in use. The radiators, it is claimed, are pressed in such a manner that when the halves are knit together they are practically air tight, preventing leakage. It is uncertain where the factory for the manufacture of these goods will be located. F. J. Weber of the Steel Storage & Elevator Construction Company of Buffalo is interested.

Certificate of incorporation has been filed by the Buffalo Automatic Mfg. Company, at Buffalo, N. Y., and the company will engage in the manufacture of automatic telephones. The directors are Lee Ephriam, Henry Ephriam and Louis Seyfang.

The Buffalo Spring & Gear Company, Buffalo, N. Y., have become insolvent, owing to complicated financial embarrassment of one of their principal customers. Application for the appointment of a receiver has been made by the directors. The liabilities of the company aggregate $314,000. The company have a large plant, completely equipped for the manufacture of light vehicles, which has been their trade specialty.

The new plant of the American Cabinet Company, which is being built about two miles north of the city of Buffalo, N. Y., will be one of the largest furniture factories in the country and will consist of four large buildings and several smaller structures. Work on the buildings is nearing completion, and it is expected the plant will be in operation about Feb. 1. Twelve carloads of machinery have just arrived for installation. In connection with the factory the company are building an industrial village adjacent to the plant, which will be known as Elmerton, where 50 or more houses are to be built at once and others added as required by employees.

The Victor & Burg Bros. Mfg. Company, Denver, Col., have organized for the manufacture of Victor safety acetylene gas machines, gas and electric fixtures, &c.

The business of the E. Jenckes Mfg. Company, Pawtucket, R. I., will hereafter be conducted by two new corporations, the Jenckes Spinning Company, who have taken over the manufacture of cotton yarn, and the E. Jenckes Mfg. Company, who have taken over the manufacture of knitting machines, wire goods, &c. With this division and the additional factory now being erected, both companies will have increased facilities. The management of the former company continues, the officers of both companies being the same. They are: S. A. Jenckes, president; Leroy Fales, vice-president; R. J. Jenckes, secretary; J. E. Jenckes, treasurer, and F. L. Jenckes, agent.

The Phosphor-Bronze Smelting Company, Limited, Philadelphia, Pa., have purchased a piece of property, 130 x 168 feet, near their plant for the purpose of extending their works to cover the growing demand for their products.

Charles P. Flanagan has taken over the interests of his associate, L. W. Sanford, in the Union Roofing & Supply Company, Niles, Ohio, and now controls the plant. He is having plans prepared for the enlargement of the plant which will double its capacity.

The Rochester & Lake Ontario Water Company have been incorporated with a capital stock of $2,500,000, divided into 25,000 shares of a par value of $100 each. The company's office will be in Rochester, and the villages of Brighton, Fairport, Greece and Gates are to be supplied with water, permits having already been obtained from the authorities. The names of the seven directors, their addresses and the number of shares of stock held by each are as follows: George M. Bunting, Philadelphia, 1250 shares; S. Q. Mingle, New York, 1250 shares; H. B. Mingle, New York, 10 shares; William B. Leigh, Philadelphia, 5 shares; H. Bayard Hodge, New York, 10 shares; Edward Harris, Rochester, 10 shares; Albert Harris, Rochester, 10 shares.

The Cleveland Water Works Department have opened bids on 15,000 water meters. The Neptune Meter Company of New York offered them at $6.50 per meter and the Thompson Meter Company, Brooklyn, at $6.60.

At the recent auction sale of the plant of the E. Stebbins Mfg. Company, Springfield, Mass., brass founders and finishers, Frederick Harris bid in the property for $50,000 in the interest of a syndicate of the creditors, who have in contemplation a reorganization of the company. In the meantime the business will be conducted by A. H. Warner as agent, who has authority to make contracts and carry on the business, all of which will be assumed by the reorganized company.

The National Corundum Wheel Company, Clayville, N. Y., have purchased the foundry and machine shop of A. E. King & Co., which they are preparing to equip with the most modern machinery for the manufacture of corundum and emery wheels. The company have their own mines and will mine, crush and prepare the material for their wheels. The crushing machinery has not yet been installed. They will also continue the manufacture of wagon makers' and hardware supplies, including the Clayville skeins and boxes, 200 sets of which have been recently ordered by one firm. W. L. Baker is president, H. L. Holmes secretary, and J. F. Spohn treasurer and superintendent.

The Harmon Steel Fence Post Company of Rosewood, Ohio, have incorporated and will establish a plant at Rosewood. Incorporators: E. F. Harmon, C. F. Hateman, Byron Pickering, M. E. Winter and T. J. Geck.

## The United States Steel Corporation's Earnings in 1902.

The United States Steel Corporation have made public their preliminary annual statement for the year ended December 31 last. The statement does not permit of comparisons with the previous year, as the fiscal year was changed in May last so as to make it end with the calendar year instead of on March 31. A complete annual report with general balance sheet, financial statements, statistics, &c., will be submitted at the annual meeting in April, or as much earlier as it can be furnished. The statement of earnings just issued is as follows:

*Net Earnings.*

| | |
|---|---|
| January, 1902 | $8,901,016 |
| February, 1902 | 7,678,583 |
| March, 1902 | 10,135,858 |
| April, 1902 | 12,320,766 |
| May, 1902 | 13,120,930 |
| June, 1902 | 12,220,362 |
| July, 1902 | 12,041,914 |
| August, 1902 | 12,972,729 |
| September, 1902 | 11,930,846 |
| October, 1902 | 12,652,707 |
| November, 1902 | 10,686,906 |
| December, 1902 (estimated) | 8,000,000 |
| Total net earnings after deducting each month the expenditures for ordinary repairs, renewals and maintenance of plants, also interest on bonds and fixed charges of the subsidiary companies | $132,662,617 |
| Deduct amounts set aside for the following purposes—viz.: | |
| Sinking funds on bonds of subsidiary companies | $624,064 |
| Depreciation and reserve funds (regular provisions for the year) | 13,004,119 |
| Special fund set aside for depreciation and improvements | 10,000,000 |
| | 24,528,183 |
| Balance of profits for year applicable for United States Steel Corporation securities | $108,134,434 |
| Deduct: | |
| Interest on United States Steel Corporation bonds for year | $15,200,000 |
| Sinking fund on United States Steel Corporation bonds for year | 3,040,000 |
| | 18,240,000 |
| Balance | $89,894,434 |
| Dividends for year on stocks of United States Steel Corporation—viz.: | |
| Preferred, 7 per cent | $35,720,179 |
| Common, 4 per cent | 20,332,690 |
| | $56,052,869 |
| Undivided profits for the year applicable to increase "depreciation and reserve fund" accounts, for new construction or surplus | $33,841,565 |

The earnings for the year ended March 31, 1902, were $111,067,195, and the then surplus was $24,449,717.

A comparative statement for the last quarter of the year just passed was also made public. This statement follows:

| Earnings for quarter ending December 31 | 1902. $31,339,613 | 1901. $29,759,912 |
|---|---|---|
| | December 1, 1902. | December 1, 1901. |
| Cash on hand | $54,724,106 | $55,315,528 |
| Total current assets | 222,367,839 | 206,261,772 |
| *Liabilities.* | | |
| Purchase money obligations and bills payable | $14,065,461 | $28,264,498 |
| Other current liabilities | 35,246,402 | 37,615,886 |
| Totals | $49,311,863 | $65,880,384 |
| Net current assets | 173,055,976 | 140,381,388 |
| Increase in net current assets | 32,674,588 | ..... |

The amount of orders on hand December 31, 1902, was 5,347,253 tons, as against 4,497,749 tons on December 31, 1901. The amount of bonds in the hands of the public on December 31, 1902, was $363,745,802, and on December 31, 1901, it was $366,298,721.

These figures were given out after a regular meeting of the Board of Directors of the corporation on January 6. At this meeting the board amended the by-laws by increasing the number of the Finance Committee, and Henry C. Frick and Robert Bacon, who recently retired from J. P. Morgan & Co., were elected members of the committee. The board approved the action of the Finance Committee in making purchase of the Troy furnaces and steel works and of the Union Steel and Sharon Steel plants.

The board also approved the plan reported by the Finance Committee for profit sharing and subscription to stock by the employees. It was reported to the board that this plan for stock subscription was being well received by the employees, and that within three days after opportunity to subscribe was given upward of 13,000 shares had been subscribed for.

## New Publication.

**Letters from a Self Made Merchant to His Son.** By Horace Lorimer. Small, Maynard & Co., Boston. 312 pages. Illustrated.

Those who are looking for something original but not improbable, bright but not overstrained, interesting but not frivolous, thoughtful but not heavy, wise but not pedantic, will find this book just to their liking. It has not a dull page in it, but scintillates with wit and humor from cover to cover. Purporting to be letters written by John Graham, head of the house of Graham & Co., pork packers in Chicago, to his son Pierrepont, the plan of the book offers an admirable opportunity for the bestowal of good advice to young men from the time they go to college until they have established for themselves a business footing, and are in a position to marry and enter upon the more serious duties of life.

The book comprises 20 letters or chapters, following the course of the boy through college, into a subordinate position in his father's establishment, on the road as a traveling salesman, through successive promotions, up to his development into a man of some value to the business. Youthful follies, vanities, mistakes and escapades, sorely trying to a hard headed business man, are the subjects of special letters. But John Graham, with all his hard headedness, is a teacher who does not forget that he was once a boy, and his efforts to lead his son's ideas in the right direction are full of sympathy and leniency, while at the same time he uses homely proverbs, quaint metaphors and anecdotes apparently drawn from his own experience to drive home a full appreciation of the point he is making against a foolish habit or tendency. The book abounds in epigrams, a few of which follow:

"Education's a good deal like eating—a fellow can't always tell which particular thing did him good, but he can usually tell which one did him harm."

"There isn't any such thing as being your own boss in this world unless you're a tramp, and then there's the constable."

"You can trust any number of men with your money, but mighty few with your reputation. Half the men who are with the house on pay day are against it the other six."

"There's no easier way to cure foolishness than to give a man leave to be foolish."

"The easiest way in the world to make enemies is to hire friends."

"To get any sense out of a proverb I usually find that I have to turn it wrong side out."

"The only animal which the Bible calls patient is an ass, and that's both good doctrine and good natural history."

"It's easy to have the confidence of the house or the confidence of the buyer, but you've got to have both. The house pays you your salary, and the buyer helps you earn it."

The book will probably be read with greater pleasure by a business man than by his son, because experience teaches us the value of good advice. But the boys should be given the opportunity to read it and perhaps they will profit by it.

At the office of the American Can Company, New York, the general manager stated that he knew nothing about the reported purchase by his company of the large plant of the Indianapolis Tin Can Company, at Indianapolis, Ind.

# The Iron and Metal Trades.

From the majority of the leading distributing centers come reports of a slight hardening tendency in Foundry Irons, although none of them notes any activity. Nor does it appear that there have been any purchases of foreign Iron on any scale by importers. The problem of bringing down domestic prices to a point where foreign sales here will be restricted is as far from a solution as ever. So many of the domestic producers are tied down with old contracts for so many months to come that energetic effective measures seem out of the question for the present. The lots of Southern Gray Forge which were offered at about $15.50, Birmingham, some time since, have disappeared.

Bessemer Pig continues very scarce in the Central West.

There is little doing in foreign Steel, the decline in some of the finished products making it impossible for many of the smaller independent mills to make ends meet at present prices of foreign Steel. From Pittsburgh comes the news that contracts aggregating 50,000 to 75,000 tons of Open Hearth Steel have been placed.

There are indications that some arrangement has been reached between German and American makers of Wire Rods in regard to the markets on this continent. This is not a matter of much significance to our own market, but is important to the Canadian Wire industry.

Some fair business, aggregating about 10,000 tons, has been placed in Chicago for Structural Steel, but generally speaking, the business in this line is quiet. The Plate mills have secured further work.

On the whole the position of the mills rolling lighter products is better. Some of the weak spots are disappearing, largely because the outside works are not competing quite as actively as they have been doing. This is true of Sheets, Merchant Pipe and Bars.

The independent Sheet makers have appointed a committee for the purpose of considering a merger.

In Steel Bars, Chicago reports the closing of a contract for 12,000 tons.

A general advance of $1 per ton has been announced on all Wire products.

In the metal markets we note a hardening in the price of Copper, and a further advance in Tin, which has been rising quite steadily for some time past.

## A Comparison of Prices.

**Advances Over the Previous Month in Heavy Type, Declines in Italics.**

At date, one week, one month and one year previous.

| | Jan. 7, 1903. | Dec. 31, 1902. | Dec. 10, 1902. | Jan. 8, 1902. |
|---|---|---|---|---|
| **PIG IRON:** | | | | |
| Foundry Pig No. 2, Standard, Philadelphia | *$22.75* | $22.75 | $23.00 | $16.50 |
| Foundry Pig No. 2, Southern, Cincinnati | *21.75* | 21.75 | 22.25 | 14.25 |
| Foundry Pig No. 2, Local, Chicago | **23.50** | 23.00 | 23.00 | 15.50 |
| Bessemer Pig, Pittsburgh | **22.35** | 21.85 | 22.00 | 16.75 |
| Gray Forge, Pittsburgh | *20.50* | 20.00 | 20.75 | 16.00 |
| Lake Superior Charcoal, Chicago. | 25.00 | 25.00 | 25.00 | 19.25 |
| **BILLETS, RAILS, ETC.:** | | | | |
| Steel Billets, Pittsburgh | 29.50 | 29.50 | 29.50 | 27.00 |
| Steel Billets, Philadelphia | *$27.00 | *$27.00 | *$27.50 | .... |
| Steel Billets, Chicago | *$29.50 | *$29.50 | *$29.50 | .... |
| Wire Rods, Pittsburgh | 34.50 | 34.50 | 34.50 | 32.50 |
| Steel Rails, Heavy, Eastern Mill | 28.00 | 25.00 | 28.00 | 28.00 |
| **OLD MATERIAL:** | | | | |
| O. Steel Rails, Chicago | *18.50* | 18.75 | 18.75 | 14.75 |
| O. Steel Rails, Philadelphia | 21.00 | 21.00 | 21.00 | 18.25 |
| O. Iron Rails, Chicago | 24.00 | 24.00 | 24.00 | 21.00 |
| O. Iron Rails, Philadelphia | 23.50 | 24.00 | 23.50 | 21.50 |
| O. Car Wheels, Chicago | 24.00 | 24.00 | 24.00 | 16.00 |
| O. Car Wheels, Philadelphia | 20.00 | 20.00 | 20.00 | 17.00 |
| Heavy Steel Scrap, Pittsburgh | **21.50** | 21.50 | 21.00 | .... |
| Heavy Steel Scrap, Chicago | *18.00* | 18.25 | 18.25 | 13.50 |
| **FINISHED IRON AND STEEL:** | | | | |
| Refined Iron Bars, Philadelphia. | 1.93½ | 1.92 | 1.92½ | 1.65 |
| Common Iron Bars, Chicago | 1.75 | 1.75 | 1.75 | 1.65 |
| Common Iron Bars, Pittsburgh. | 1.70 | 1.70 | 1.70 | 1.50 |
| Steel Bars, Tidewater | 1.75 | 1.75 | 1.75 | 1.70 |
| Steel Bars, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.50 |
| Tank Plates, Tidewater | 2.10 | 2.10 | 2.10 | 1.78 |
| Tank Plates, Pittsburgh | *1.75* | 1.75 | 1.85 | 1.60 |
| Beams, Tidewater | *1.75* | 1.90 | 2.00 | 1.75 |
| Beams, Pittsburgh | *1.90* | 2.00 | 2.00 | 1.60 |
| Angles, Tidewater | *1.75* | 1.90 | 2.00 | 1.75 |
| Angles, Pittsburgh | *1.90* | 1.90 | 1.95 | 1.60 |
| Skelp, Grooved Iron, Pittsburgh. | 1.90 | 1.90 | 1.90 | 1.70 |
| Skelp, Sheared Iron, Pittsburgh. | *1.95* | 1.95 | 2.00 | 1.75 |
| Sheets, No. 27, Pittsburgh | 2.65 | 2.65 | 2.65 | 2.90 |
| Barb Wire, f.o.b. Pittsburgh | **2.50** | 2.45 | 2.45 | 2.90 |
| Wire Nails, f.o.b. Pittsburgh | **1.90** | 1.85 | 1.85 | 2.00 |
| Cut Nails, Mill | 2.05 | 2.05 | 2.05 | 2.05 |
| **METALS:** | | | | |
| Copper, New York | **12.00** | 11.87½ | 11.65 | 11.75 |
| Spelter, St. Louis | *4.40* | 4.35 | 4.60 | 4.12½ |
| Lead, New York | 4.10 | 4.10 | 4.10 | 4.00 |
| Lead, St. Louis | 3.97½ | 3.97½ | 3.97½ | 3.90 |
| Tin, New York | **27.25** | 26.50 | 24.85 | 22.50 |
| Antimony, Hallett, New York | *7.00* | 7.12½ | 7.12½ | 8.25 |
| Nickel, New York | 40.00 | 40.00 | 40.00 | 60.00 |
| Tin Plate, Domestic, Bessemer, 100 pounds, New York | 3.79 | 3.79 | 3.79 | 4.19 |

* Foreign.

## Chicago.

FISHER BUILDING, January 7, 1903.—(*By Telegraph.*)

The most prominent feature of the Metal trade during the week has been the material strengthening of the conspicuous weak spots, such as Sheets, Merchant Pipe and Bars, independent interests apparently being determined to secure more remunerative prices and a less belligerent spirit pervading all interests alike in the market. A firm and confident tone continues to characterize other departments, but while there is a slight hardening in the Pig Iron market it is not accompanied by increased business. The demand for Structural Material is especially conspicuous, reflecting continued activity among car shops and building interests, and the same may be said of Plates. The demand for Rails also continues urgent, with liberal buying by electric roads. The Scrap market is somewhat of a conundrum. Although mills find it difficult to obtain ample supplies of desirable grades, prices seem to be going down. The troublesome fuel situation seems to have passed beyond the limits of the Iron trade. Furnaces and foundries dependent upon Coke are making fewer complaints, and although the outlook for the furnaces is not improved, foundries seem to be enabled to obtain more ample supplies at the high prices prevailing. Anthracite Coal is still scarce, but it is the stringency in the market for Soft Coal that has aroused public indignation, and it seems probable that radical measures will now be taken to relieve the harassed manufacturers and other consumers.

**Pig Iron.**—The market is still in a tangle, with prices irregular, yet the general tone seems to indicate a firmer feeling. More than ever before Irons of different makes have lost to a large degree their sympathetic relationship, Northern brands, Southern brands, Virginia grades and foreign

metal standing on a basis peculiarly their own, due to the condition of the individual furnaces, and it is most difficult to make uniform quotations, especially as to time of delivery. For instance, the fuel supply, which is light and intermittent, dominates the local situation. About six furnaces are still idle, and all of the important companies are sold to full capacity for the first three months of the year, and some into July. Therefore sales of such Iron are few and far between, being confined to resales of small lots or the swapping of Iron between consumers through the agency of the furnaces, and prices made on such lots are not a criterion for the general market. Consumers of local Iron understanding the situation and fearing they will not be able to obtain their full quota on contracts are constantly feeling the market for other grades as substitutes, and at times such inquiries are of considerable amounts, but this gives a wrong impression of the market. From the inquiries it would seem that there is a good demand, but purchases are confined to small amounts, either for spot or for various deliveries extending through the first half of the year whenever and wherever available. As a rule, buyers are seeking Malleable and Standard Bessemer Iron made in the Mahoning and Shenango valleys, and during the week from eight to ten lots, varying from 100 to 200 tons, of the latter have been sold at about $24.50, delivered, Chicago, equivalent to $22.20 at the furnace. Generally speaking, Standard Bessemer will bring about 50c. per ton over Malleable Bessemer, but much depends upon the quantities in which the Iron is sold. Malleable Bessemer for the second quarter is obtainable at $23 to $23.50, Chicago. It is an interesting feature to note that the demand now is largely for strong Iron, while heretofore preference has been given to Soft grades. To some extent Southern Iron has been affected by the same conditions prevailing in this section, but to a less degree. Two of the largest companies have orders booked for 1902 which will require the output of the first two months of 1903 to complete. Other furnaces have considerable tonnage sold for the first four months of the year. There are still other companies, however, which have Iron to sell for the second quarter, and in some instances even for the first quarter of 1903, but are demanding 50c. per ton over the prices at which Iron was sold the previous week. There has been some accumulation of Iron at furnace yards, but it has been about offset by the depletion of consumers' stocks, the accumulation in the South being due to lack of cars or other facilities for distribution to consumers. There have been sales during the week of several hundred-ton lots of Southern No. 2 Foundry on the basis of $18.50, $19 and $19.50, Birmingham, for various deliveries beginning in March and extending to July 1, but the aggregate tonnage has not been large. Some Soft Iron has been sold on the same basis. There is very little if any Southern Forge Iron available under $15 at the furnace, Birmingham, and the most producers are asking at least $16. Charcoal Iron is still scarce, but the blowing in of one or two stacks recently has resulted in the negotiation of one or two important contracts which are now pending. The following prices have been revised to conform as nearly as possible to peculiar conditions and adjustment of the recent advance in freight rates. Prices are either for the first or second quarter of 1903, according to the condition of furnaces, and in some instances small amounts for immediate delivery continue to bring moderate premiums over quotations. The following are the prices current for delivery beginning in January:

| | |
|---|---|
| Lake Superior Charcoal | $25.00 to $26.00 |
| Local Coke Foundry, No. 1 | 24.00 to 24.50 |
| Local Coke Foundry, No. 2 | 23.50 to 24.00 |
| Local Coke Foundry, No. 3 | 23.00 to 23.50 |
| Local Scotch, No. 1 | 24.50 to 25.00 |
| Ohio Strong Softeners, No. 1 | 26.30 to 27.30 |
| Southern Silvery, according to Silicon | 26.15 to 29.15 |
| Southern Coke, No. 1 | 23.85 to 24.35 |
| Southern Coke, No. 2 | 23.35 to 23.85 |
| Southern Coke, No. 3 | 22.85 to 23.35 |
| Southern Coke, No. 1 Soft | 23.85 to 24.35 |
| Southern Coke, No. 2 Soft | 23.35 to 23.85 |
| Foundry Forge | 21.85 to 22.35 |
| Southern Gray Forge | 19.85 to 20.35 |
| Southern Mottled | 19.35 to 19.85 |
| Southern Charcoal Softeners, according to Silicon | 25.85 to 27.85 |
| Alabama and Georgia Car Wheel | 29.35 to 29.85 |
| Malleable Bessemer | 23.20 to 24.20 |
| Standard Bessemer | 24.20 to 24.70 |
| Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon | 31.30 to 32.30 |

**Bars.**—There has been an improved demand for Soft Steel Bars, several large buyers being in the market, one contract for 12,000 tons having been closed during the past few days. There has also been some satisfactory specifying on contracts previously placed. The demand for Bar Iron, however, has shown but little improvement, but a little firmer tone is now apparent, few buyers quoting under 1.80c. for early delivery; but for long time contracts covering the first half of the year mills are willing to accept business on the basis of 1.75c., Chicago. There are also some odd lots held by outside interests which are still offered at 1.75c. for prompt delivery. Hoops have continued quiet. The following are the prices current: Bar Iron, 1.75c. to 1.85c.; Soft Steel Bars, 1.75c. to 1.80c.; Hoops, 2.15c. to 2.25c.; Angles, 1.85c. to 1.90c., base, mill shipment. Merchant stocks are growing low and more replenishing is taking place, although the movement from local warehouses is only moderate at the moment The outlook is favorable for a very satisfactory volume of business. The following are the prices current: Bar Iron selling at 2.15c., Soft Steel Bars at 2c. to 2.25c., Angles at 2.50c. and Hoops at 2.40c., base, from store.

**Structural Material.**—There has been a more active inquiry, especially from car manufacturers, and several gratifying orders have been placed during the week; one for 5000 tons, another for 1500 tons and others for smaller amounts, aggregating 10,000 tons in all, for delivery during the first and second quarters of 1903. There are quite a number of inquiries for material to cover building construction in and near Chicago during the spring. A firm tone continues to prevail, and prices are unchanged. There is less call for foreign material, as domestic mills are making more satisfactory deliveries. The following are the prices current: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. There has been a moderate demand for small lots from local warehouses, and prices, except for Beams and Channels, which are ¼c. lower, have remained steady, as follows: Beams and Channels, cut to length, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

**Plates.**—The market continues strong with an active demand, and sales aggregating about 6000 tons during the week, 1000 tons of which were for Universal Plates. Mills are well sold ahead, and have all they can do to fill orders previously placed. The following are the prices current: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.10c.; Marine, 2.10c. to 2.20c. The demand from local stocks is moderate and readily met at the following prices: Tank Steel, ¼-inch and heavier, 2.25c. to 2.35c.; Tank Steel, 3-16-inch and No. 8, 2.30c. to 2.45c.; Flange, 2.50c. to 2.60c., all f.o.b. warehouse, Chicago.

**Sheets.**—There has been further improvement noted in the market for both Black and Galvanized Sheets, there being less disposition to cut prices, and with an improved demand the market is firmer in tone. The following are the official prices for Black Sheets, mill shipment, carload lots, f.o.b. Chicago: No. 20, 2.55c. to 2.60c.; Nos. 22 and 24, 2.60c. to 2.70c.; No. 26, 2.70c. to 2.80c.; No. 27, 2.80c. to 2.90c.; No. 28, 2.90c. to 3c. Small lots from store are selling at 15c. to 20c. above mill prices. Galvanized Sheets are selling more readily and are firmer in tone, there being few mills willing to make better discounts than 75 and 10, with a moderate freight allowance. The following are the net prices: No. 27, 3.25c. to 3.50c., for mill shipment, and small lots from store at 3.40c. to 3.65c., Chicago.

**Cast Pipe.**—There has been a fair inquiry for moderate amounts of the smaller sizes from mining companies and railways in the West, but few municipal contracts are pending, the high prices being a drawback to business of this character. It is estimated that aggregate sales during 1902 in this market were 300,000 tons. The following are the prices current, f.o.b. Chicago: 4-inch, $36; 6-inch, $35; 8-inch and upward, $34 for Water Pipe; Gas Pipe selling $1 per ton higher, f.o.b. Chicago. For small quantities 50c. to $1 per ton more is charged.

**Billets.**—There has been more inquiry for both domestic and foreign Steel, but no large contracts have resulted. Several 1000-ton lots of German Billets have been sold through Chicago interests on the Atlantic seaboard, but nothing to come into this section. Prices are nominally quotable at $29.50 to $30, delivered, Chicago. It is reported that because of the chartering of many steamers for Coal there is a scarcity of freight room for Billets, it being almost impossible to obtain steamers for New Orleans or other Gulf ports at the present time. Domestic Open Hearth Billets are firm, with a fair inquiry, and sales of small lots range from $36 to $40, according to analysis, buyer and time of delivery. Rerolling Billets are nominally quotable at $30, f.o.b. Chicago.

**Merchant Pipe.**—There is considerable inquiry for small lots of assorted sizes, and several large contracts are pending for delivery during the early spring months. A little firmer tone prevails, independent interests showing more disposition to demand and obtain more remunerative prices. It is estimated that shipments from and through Chicago during the year 1902 aggregated about 240,000 tons. The following are the official prices, Chicago, base, random lengths, for mill shipment, carloads only:

| | Steel Pipe. | | Guaranteed Wrought Iron. | |
|---|---|---|---|---|
| | Black. Per cent. | Galvd. Per cent. | Black. Per cent. | Galvd. Per cent. |
| ⅛ to ⅜ inch | 66½ | 56½ | 63½ | 53½ |
| ½ inch | 68½ | 58½ | 65½ | 55½ |
| ¾ to 6 inches | 73½ | 63½ | 70½ | 60½ |
| 7 to 12 inches | 71½ | 61½ | 68½ | 58½ |

**Boiler Tubes.**—There has been a moderate consumptive order trade, and the market has remained steady. The following table of discounts is current for mill shipment:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 43½ | 38 |
| 1¾ to 2½ inches | 56 | 36 |
| 2¾ to 5 inches | 61 | 46 |
| 6 inches and larger | 56 | 36 |

There has been some little improvement in the demand for small amounts for shipment from local stocks, and the market is steady at the following schedule of discounts:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 35 | 35 |
| 1¾ to 2½ inches | 47½ | 32½ |
| 2¾ to 5 inches | 55 | 42½ |
| 6 inches and larger | 47½ | .. |

**Merchant Steel.**—One of the leading interests in the market reports that shipments during December, 1902, were 50 per cent. greater than during the preceding December, and in fact the largest not only of any preceding December, but of any month in the history of the trade, both in volume and in value. There continues to be a fair degree of activity in the placing of contracts for Crucible Steel, and the market remains steady. For mill shipment prices are as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.95c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 47 off in carload lots and 42 off in less than car lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 8c. for mill shipments; specials, 12c. upward.

**Rails and Track Supplies.**—There has been a fair demand for Standard Sections, especially from electric roads, several lots having been placed during the week; one for 3000 tons for the Rockford & Inter-Urban Railway for delivery in May, another for 1500 tons and other lots aggregating about 6000 tons. The bulk of the business was taken by Eastern mills, the local company finding it almost impossible to take important tonnage until late in the year. Official prices for domestic Rails remain firm at $28 for Standard and $27 for second quality, mill shipment. Light Rails are in urgent demand, and sell readily at $35 to $40, according to weight. The Track Supplies of all kinds continue strong, with an active demand. We quote as follows: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.25c.; Square Nuts, 2.95c. to 3.10c.

**Old Material.**—The market is somewhat easier in tone for Heavy Melting Steel and Cast Scrap. Agricultural Malleable is also quoted lower, although the offerings are but little increased, and there is a fair outlet through mills. The following are the prices per gross ton, Chicago:

| | |
|---|---|
| Old Iron Rails | .... to $24.00 |
| Old Steel Rails, mixed lengths | $18.50 to 19.00 |
| Old Steel Rails, long lengths | 23.50 to 24.50 |
| Heavy Relaying Rails | 31.50 to 32.00 |
| Old Car Wheels | 24.00 to 24.50 |
| Heavy Melting Steel Scrap | 18.00 to 18.50 |
| Mixed Steel | 15.50 to 16.00 |

The following quotations are per net ton:

| | |
|---|---|
| Iron Fish Plates | $21.00 to $22.00 |
| Iron Car Axles | 24.50 to 25.00 |
| Steel Car Axles | 23.50 to 24.00 |
| No. 1 Railroad Wrought | 19.50 to 20.00 |
| No. 2 Railroad Wrought | 17.50 to 18.00 |
| Shafting | 20.00 to 21.00 |
| No. 1 Dealers' Forge | 16.00 to 16.50 |
| No. 1 Busheling and Wrought Pipe | 14.00 to 14.50 |
| Iron Axle Turnings | 14.00 to 14.50 |
| Soft Steel Axle Turnings | 14.50 to 14.75 |
| Machine Shop Turnings | 13.50 to 14.00 |
| Cast Borings | 10.00 to 10.25 |
| Mixed Borings, &c | 10.50 to 11.50 |
| No. 1 Boilers, cut | 14.50 to 15.00 |
| Heavy Cast Scrap | 17.25 to 17.75 |
| Stove Plate and Light Cast Scrap | 13.50 to 14.00 |
| Railroad Malleable | 16.25 to 16.50 |
| Agricultural Malleable | 15.00 to 15.50 |

**Metals.**—There has been a stronger market and higher prices prevailing for Copper, although there has been but little increase in the demand in this market. Lake is held at 11¾c. to 12c. in car lots and 12¼c. in a jobbing way. Pig Lead has continued in fair demand and firm at 4.05c. in 50-ton lots, 4.07½c. in carload lots and 4.10c. in a jobbing way. Spelter has been in better demand at 4.45c. in car lots, f.o.b. Chicago. Sheet Zinc has been easier in tone at 6¼c. in lots of 600 lbs. and over. Old Metals have been quiet, but held a little more firmly, as follows: Heavy Cut Copper, 10¼c.; Red Brass, 10¼c.; Copper Bottoms, 9¼c.; Lead Pipe, 3.90c.; Zinc, 3.80c.

**Coke.**—The moderate offerings of Connellsville Foundry Coke on track have been sold at $10 and Virginia Coke at $9 per ton, spot, Chicago. Ovens are asking $4 per ton for contracts covering the entire year, but the local market has been very quiet.

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**The Emlyn Iron Works.**—CHICAGO, ILL., January 6, 1903.—A meeting of the stockholders of the Emlyn Iron Works has been called for February 10 for the purpose of voting upon the proposition to increase the capital stock of the company from $250,000 to $500,000.

## Philadelphia.

FORREST BUILDING, January 6, 1903.

"One swallow does not make a summer," but metaphorically speaking one or two of them have been seen during the past week, and the business atmosphere is in consequence something less chilly. It cannot be said that much actual business has been done so far, but there is a good deal of it around, although the uncertainty in regard to prices checks the closing up of new contracts temporarily. It is an exceedingly difficult matter to find exact figures just now, some holders being inclined to look for slightly higher prices to offset the advance in freights, &c. Others are willing to accept business at the average figures of last month, while nobody seems disposed to name distinctly lower figures. Sellers base their ideas on the fact that they have no Iron on hand of any account, and have a good deal sold for forward delivery, while the difficulty in getting Coal, Coke and cars leads to the impression that there will be no surplus Iron for a long time to come. Sellers will no doubt modify their ideas if it becomes necessary to do so, but for the time being prices are purely a matter of policy. It is believed that quoted rates can be had without much difficulty, so that for the present they are disposed to see "which way the cat will jump" before they recede from their position. Recent developments appear to have favored sellers beyond what was expected. Prices during December and January are usually around low tide, but as far as can be seen there has been no break, and no pressure to indicate the probability of one in the immediate future. Foreign advices are also somewhat stronger, particularly from Germany, and while there may be no advance in foreign material, it is reasonably certain that the lowest figures have been seen for some time to come. This is really a surprise, as a dull and somewhat weak market was generally expected during December and January, but so far it has not shown itself in this territory. Still the position is a tentative one, and until an actual start is made it will not be safe to take everything for granted. The feeling is unquestionably one of confidence, and to that extent the new year begins well.

**Pig Iron.**—It is difficult to size up the market with much satisfaction. Prices are not sufficiently established to name exact figures. Some quote $23.50 for No. 2 X Foundry, others $23, and some might accept a little less than that for a three months' delivery, but at these prices buyers are not prepared to take more than hand to mouth lots. It is an open question, therefore, whether sellers will offer additional inducements for immediate contracts or maintain their position pending further developments. There is no doubt that both buyers and sellers have been looking for moderate concessions, but recent events have imparted a more confident feeling, and about the most that is expected for a while is steady and unchanged prices. The advance in freights is quite an item, and whether the burden is to be carried by the buyer or the seller is another question which awaits settlement. The strongest feature, however, is in the smallness of stocks. Consumers' yards are almost empty, and as furnace banks are also pretty well clear of stocks, there is no probability of accumulations for a long time to come. Some of the local furnaces are figuring on a larger output, but the demand for prompt shipments is likely to absorb all that can be produced—temporarily at all events. Coal and Coke are almost as scarce as ever, and transportation is liable to cause a good deal of trouble before things are in proper working order, so that there is plenty of room for differences of opinion in regard to prices. Foreign Iron is also presenting a stronger front, and while business can still be done at the figures of the past few weeks, late advices from Europe indicate a better feeling, with a fair probability that imports will not be as large as they have been, unless somewhat higher prices can be obtained. Nevertheless, it ought not to be considered that prices are settled. It may take two or three weeks to do that, but in the meanwhile we have endeavored to reflect the present opinions of both buyers and sellers, leaving the final outcome to be determined by actual transactions. As near as can be given in such a market as the present, prices for Philadelphia and nearby points are quoted as follows: Cargo lots of Middlesbrough No. 3, about $17, German (Westphalia), $20, and Hematites at $20 to $20.25. Such prices, however, are for full cargoes, c.i.f., duty paid, cash against documents. General quotations for deliveries in buyers' yards, usual terms, are as follows:

| | |
|---|---|
| No. 1 X Foundry | $24.00 to $25.00 |
| No. 2 X Foundry | 22.75 to 23.25 |
| No. 2 Plain | 22.00 to 22.50 |
| Gray Forge | 20.50 to 21.50 |
| Middlesbrough, No. 3 | 21.00 to 21.50 |
| Scotch | 22.50 to 23.50 |

**Billets.**—There is a fair inquiry, and business is under negotiation at about $27 for foreign Steel, cash against documents, or $28 to $28.50, usual American terms. American Steel, $30 to $32.50, but no recent sales have been reported.

**Plates.**—The demand for Plates promises to be larger than ever during the next three months. The heaviest ton-

nage will go to the car and locomotive shops, although bridge and ship builders will be large consumers, in addition to which the small consumers will require a great deal of material in the aggregate. It is to be regretted that the prospects for making a full output is not satisfactory, as both Coal and motive power are extremely difficult to secure, and it is feared that this will continue longer than is generally expected. Prices are firm and unchanged, as follows: Small lots, 2.10c. to 2.15c.; carload lots, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flanges, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.: Marine, 2.30c. to 2.35c.

**Structural Material.**—The demand is quite as good as could be expected at this season of the year, but mills are in a position to make fairly prompt deliveries without asking more than the regular quoted rates. Small sizes are quite plentiful, but medium sizes are scarce, and a little more money may be asked for them, but all depends on the character of the order. For this district the usual prices are as follows: Angles, Beams or Channels, ordinary sizes, 1.73½c. to 1.78½c., carload lots, as a minimum.

**Bars.**—The scarcity of Coal has kept some of the mills closed for nearly two weeks, and resumption is still on a somewhat limited scale. Business could be had at full prices, but until an ample supply of fuel can be secured mills will be in no hurry to start up. There is no scarcity of Bars for the present, however, and fair deliveries can be had of both Iron and Steel at the usual rates, viz.: 1.93½c. to 1.98½c. for Refined Iron in carload lots as a minimum, and 1.73½c. to 1.80c. for Steel, except large sizes, which are scarce and command a premium for prompt shipments.

**Sheets.**—There is a good deal of inquiry for material and some fairly good sales have been made, but there is still more or less irregularity in prices. The scarcity of fuel and the high prices for raw material will probably lead to better prices in the near future, but in the meanwhile business is taken at about last month's prices. Specially desirable orders as to quantity and delivery may possibly be placed at slight concessions, but the feeling is pretty confident that prices are now close to bottom figures.

**Old Material.**—There is a better demand for everything and holders are asking full prices, which from present appearances will have to be paid before any large tonnage can be had. Bids and offers are about as follows, delivered in buyers' yards:

| | |
|---|---|
| Old Steel Rails | $21.00 to $21.50 |
| Heavy Steel Scrap | 20.00 to 21.00 |
| Low Phosphorus Scrap | 26.50 to 27.50 |
| Old Steel Axles | 25.00 to 26.00 |
| Old Iron Rails | 23.50 to 24.50 |
| Old Iron Axles | 29.00 to 30.00 |
| Old Car Wheels | 20.00 to 21.00 |
| Choice Scrap, R. R. No. 1 Wrought | 22.50 to 23.50 |
| Country Scrap | 20.00 to 21.00 |
| Machinery Cast | 19.75 to 20.25 |
| No. 2 Light Scrap | 18.00 to 19.00 |
| No. 2 Light (Ordinary) | 14.50 to 15.00 |
| Wrought Turnings | 16.00 to 16.50 |
| Wrought Turnings, Choice Heavy | 17.00 to 17.50 |
| Cast Borings | 10.00 to 10.50 |
| Stove Plate | 14.00 to 15.00 |

Matthew Addy & Co. have arranged for the transfer to them of the foreign Ore business, which for many years was conducted by Geo. T. Barnes & Co. of this city. Addy & Co. have moved into the offices Nos. 1625-1626 Real Estate Trust Building, with ample accommodations for the additional business.

## Pittsburgh.

*(By Telegraph.)*

PARK BUILDING, January 7, 1903.

**Pig Iron.**—We note a continued scarcity in the supply of Pig Iron, due to shortage in Coke, and very little Bessemer Iron is to be had for shipment in the first three months and a good deal of Iron has been sold for the second quarter delivery. Furnaces continue to bank for want of Coke and it is said that on Saturday, January 3, 11 stacks of the United States Steel Corporation were banked for this cause. Bessemer Iron for shipment over the first six months is held at about $21.50 at Valley furnace. For January, February and March shipment $22 to $22.50 is quoted. Forge Iron is somewhat quiet in demand and is held at $20.50 to $20.75, Pittsburgh. We note a sale of 1000 tons at the higher price. There is a good deal of inquiry for small lots of Foundry Iron and Northern No. 2 for prompt delivery brings $23.50 to $24, Pittsburgh. Some foreign Foundry Iron is coming into this market at slightly lower prices than the above.

**Steel.**—The Steel market is more active than for some time, and prices are very firm. Domestic Bessemer Billets are held at $29.50 to $30 and Open Hearth, Ordinary Carbons, at $30.50 to $31, Pittsburgh. We note large sales of Open Hearth Billets for delivery through all of this year, aggregating 50,000 to 75,000 tons.

*(By Mail.)*

Pittsburgh is threatened with another freight congestion, the Baltimore & Ohio Railroad having recently sent out notices that they will not accept carload freight for points east of Pittsburgh, Moundsville and Parkersburg. In spite of this deplorable condition the Supreme Court of the United States has just rendered a decision that the Wabash Railroad, which has been trying for months to get its lines into this city, cannot enter the city without securing a franchise from councils. The result of this has been that all work within the city limits on the proposed extension of the Wabash has been stopped. It is believed, however, that councils will soon pass ordinances allowing this road to extend their lines into Pittsburgh. Shipments of Coke in the past week have been somewhat better and five or six furnaces in the Valleys that were down for want of Coke have again started up.

The general situation in the Iron trade is extremely quiet, but the market is firm. Pig Iron is scarce and is bringing high prices, local No. 2 Foundry Iron for small lots selling as high as $24 to $24.50, Pittsburgh. Steel is scarce and prices on the other side have advanced about six shillings a ton in the past two weeks. The demand for Finished Iron and Steel, aside from Sheets, is active, Wire products and Tin Plate having shown a material increase in tonnage. The profit sharing plan announced by the United States Steel Corporation, Pressed Steel Car Company and the Republic Iron & Steel Company meets with general approval here. It is possible, however, that some legal obstacles may be thrown in the way of selling stock to employees at less than market value.

**Plates.**—We note a continued large tonnage in Plates, among inquiries in the market being one from the Standard Oil Company for 3500 to 4000 tons of Plates, to be used in building Steel cars and stills. The Plate Association will holds its regular quarterly meeting in New York next week. Prompt Plates continue to bring from 1.75c. up to 2c. and higher on large orders, and for extended delivery we quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

**Ferromanganese.**—There is hardly enough Ferro being sold to fix a price. English Ferro is held at $50 in large lots, but on a firm offer and for a large contract this would probably be shaded. For small lots $52.50 is quoted. These prices are for delivery f.o.b. buyer's mill.

**Structural Steel.**—There seems to be some falling off in the placing of large contracts, but there is a steady stream of small inquiries which aggregate a large tonnage. A good deal of bridge work is being placed and the bridge shops are filled up for months ahead. Two or three fairly large jobs are about ready to be placed. Prompt Beams and Channels continue to bring slight premiums over regular prices. We quote for extended delivery: Beams and Channels up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.85c.

**Sheets.**—The tone of the market is fairly strong, but demand for Sheets continues quiet and quite a number of mills are closed for want of orders. It is reported that the independent Sheet mills have appointed a committee to take up the matter of consolidating the independent Sheet mills into one large interest. We quote Nos. 22 and 24 Black Sheets, box annealed, one pass through cold rolls, at 2.45c; No. 26, 2.55c.; No. 27, 2.65c., and No. 28, 2.75c. These prices are for carloads and larger lots, buyers charging the usual advances on small lots from store. On Galvanized Sheets we quote Nos. 26, 27 and 28 at 75, 10 and 2½ to 75, 10 and 5 per cent. off for carloads and larger lots. In net prices these are equal to about 3.25c. for No. 26, 3.42c. for No. 27, and 3.70c. for No. 28. These prices apply only on carloads and larger lots and are f.o.b. mill. On less than carloads jobbers charge the usual advances.

**Hoops and Bands.**—Tonnage has increased materially, some large orders having been placed with the mills for shipment within the next three months. We quote Cotton Ties at 95c. a bundle. Steel Hoops from Bessemer stock are 1.90c. in 250-ton lots and over, and 2c. in carloads, at mill. Bands are quoted at 1.60c. up to No. 12 gauge, with extras as per Steel Bar card. For Open Hearth stock $2 a ton advance is charged.

**Muck Bar.**—The market continues quiet as regards sales, but prices are fairly strong. Leading makers of domestic Muck Bar are holding prices at $33.50 to $34, Pittsburgh. Eastern Muck Bar is being offered at about $32.50, delivered in this market.

**Steel Rails.**—Some small orders are being placed, but no large contracts are being given out. The Rail mills are said to be sold up to next September. Foreign Rails can be laid down at about $31.50, ex-ship, duty paid. We quote at $28, at mill, for Standard Sections.

**Spelter.**—Prices of Spelter continue to steadily decline, and prime Western grades are offered at about 4.50c., Pittsburgh. The weakness in prices is checking demand, and very little is doing.

**Rods.**—We do not hear of any sales to note, and Bessemer Rods are held at about $34.50, Pittsburgh. If any large business were offering this price would probably be shaded.

**Bars.**—Tonnage in Bars continues fairly large, and indications are that a good deal of business will be placed within a short time, as some good sized inquiries are in the market. Prices of Steel Bars are very firm, but on Iron Bars some shading is being done on good sized orders. We quote Iron Bars at 1.70c. to 1.80c. in carloads and 1.85c. in small lots, half extras, as per National card. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10 per lb. extra. Quantities less than 1000 lbs., 0.30 per lb. extra, the total weight of a size to determine the extra regardless of length.

**Merchant Steel.**—There is a fair inquiry and the mills are booking a moderate amount of tonnage right along. Some good sized contracts for Crucible Tool Steels for 1903 delivery have recently been placed. For mill shipment we quote as follows: Tire, 1.90c. to 2c.; Spring, 2.10c. to 2.15c.; Toe Calk, 2.10c. to 2.15c., base; Sleigh Shoe, 1.90c. to 2c. Differentials are as follows: Less than 2000 lbs. of a size and not less than 1000 lbs., 10c. advance; less than 1000 lbs. of a size, 30c. advance; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. in less than carloads, delivered in territory east of the Mississippi and north of the Ohio rivers. Tool Steel is 6½c. to 10c. for ordinary grades and 12c. and upward for special grades.

**Merchant Pipe.**—Demand continues heavy, being nearly twice as large as at this time last year. Prices are firm, and Pittsburgh basing discounts on carloads, are as follows:

| | Merchant Pipe, Steel or Iron. | | Merchant Pipe guaranteed Wrought Iron. | | Full weight Steel Pipe. | | Full weight guaranteed Wrought Iron. | |
|---|---|---|---|---|---|---|---|---|
| | Blk. | Galv. | Blk. | Galv. | Blk. | Galv. | Blk. | Galv. |
| ⅛, ¼ and ⅜ | 68 | 58 | 65 | 55 | 67 | 57 | 64 | 54 |
| ½ | 70 | 60 | 67 | 57 | 69 | 59 | 66 | 56 |
| ¾ to 6 | 75 | 65 | 72 | 62 | 74 | 64 | 71 | 61 |
| 7 to 12 | 73 | 63 | 70 | 60 | 72 | 62 | 69 | 59 |

NOTE.—Orders for less than carloads will be charged at 12½ per cent. advance. Extra and Double Extra Strong cut lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet.

**Skelp.**—There is very little doing and the tone of the market continues weak. We quote Grooved Iron Skelp at 1.90c.; Sheared, 1.95c. to 2c., and Grooved Steel Skelp, 1.90c., f.o.b. Pittsburgh, or 2 per cent. off for cash in 30 days.

**Boiler Tubes.**—Only small lots are being placed, but the mills are booked up for the next three or four months. Discounts are as follows:

BOILER TUBES.

| *Steel.* | Per cent. |
|---|---|
| 1 to 1½ inches | 45 |
| 2¼ to 5 inches | 62½ |
| 1¾ to 2¼ and 6 to 13 inches | 52½ |
| *Iron.* | |
| 1 to 1½ inches | 36½ |
| 2¼ to 5 inches | 45½ |
| 1¾ to 2¼ and 6 to 13 inches | 35½ |

| CASING. | S. and S. Per cent. |
|---|---|
| 2 to 3 inches | 58 |
| 3¼ to 4 inches | 60 |
| 4¼ to 12½ inches | 63 |

**Coke.**—Coke continues scarce, and strictly Connellsville 72-hour Foundry for January and February shipment, is bringing $6 to $7 a ton. Contracts for Furnace Coke have nearly all been placed, prices ranging up to $4 a ton. Furnace Coke for prompt shipment brings $5 to $6 a ton. Output of Coke in the upper and lower Connellsville regions last week was about 270,000 tons.

**Old Material.**—The Scrap market continues quiet, but dealers who have large stocks on hand are very confident that demand will soon improve, and are very firm in their ideas as to prices. We quote Heavy Melting Stock at $21.50 to $22, gross tons; No. 1 Cast Scrap, $19 to $19.50, gross tons; No. 1 Wrought Iron Scrap, $21, net tons; Old Iron Rails, $24 to $24.50, gross tons.

During the year 1902 the S. Obermayer Company of Cincinnati, Ohio, shipped 2940 full carloads, or 52,144 net tons of foundry facings and supplies.

## Birmingham.

BIRMINGHAM, ALA., January 5, 1903.

The new year opens with the tone of the market better than it has been in the immediate past. Considering the season of the year, when everything is usually quiet and orders are obtained only by hustling for them, inquiry can be stated as very fair and the transactions as in excess of expectations. There were no large ones, but the number was greater than sellers anticipated. The selling interests are greatly encouraged at the prospects for a continuous good demand, as indicated by the business so far. There is no disposition to shade prices in anticipation of lower values. The quotations obtained and herewith appended are based on actual transactions. It can be truthfully stated that in several instances the figures here given have been "lifted" in transactions. Great interest centers in the course that will be pursued by the buyers of Mill Iron, in view of the fact that in some quarters they have been given a lower quotation than were current in the market. Your correspondent can find no disposition on the part of any seller here to name or accept the figures that are named for them by some of the buying markets. Quotations for nearby or spot delivery and for the first quarter are nearer a parity than they have been for some time. Some quote No. 2 Foundry at $21 and some quote it at as low as $20. One seller says he sold at $20.60 for delivery during the first quarter of 1903, and in one instance there was a sale at $20.75, for that delivery. There was a sale of a very fair lot covering the year from January to January, at $19.50, and another sale was reported at $19.50, delivered from and after April; and there were sales for the last half of the year at $19.50. But the sales for this delivery, so far as their magnitude is concerned, are not, as yet, of any importance. The lowest obtainable quotation on Gray Forge is $17, and some interests are asking $17.50, while there are some that ask as high as $18 for it. No seller has any of it displayed on the bargain counter. We hear of some, high in phosphorus, from other districts that can be had at lower values. No. 4 Foundry is quoted at $17.50, with some asking $18. No. 3 Foundry is quoted at $18.50; No. 1 Foundry runs the gamut of price list from $21 to $22, and Nos. 1 and 2 Soft are quotable usually at the top prices of Nos. 1 and 2 Foundry. Silver Gray is about $1 over No. 1 Foundry. These quotations show a gradual settling down of business to normal conditions, and the trade is glad to see it. They all want to see the market get to a legitimate business basis. There is an improvement in the car situation, we are glad to chronicle. More cars are being furnished, and there is a prospect of a continuous improvement from now on. This will be gratifying information to those buyers whose purchases have been so long belated, but the extent of the relief in this respect is not uniform. Some of the railroads are catching up at a very slow rate, but all are making every effort to clean up old business. A very interesting question will come up concerning this belated business. The freight rate was protected up to December 31. After that date shipments were subject to the increased tariff. The Iron was tendered the roads and they could not furnish the cars. The question is, who is liable for the penalty of increased freight, the shipper or the railroads? Coal is in the same condition that Iron is. There is a slight improvement and the delivery of cars has slightly increased, but the relief so far is only small. The adoption of labor saving implements is increasing, and their adoption promises to largely augment the output this year.

Nothing favorable can be said of the Coke situation. It is scarce to very scarce, and would find ready sale at $7. Those who make its sale a specialty tell your correspondent it cannot be had at the moment, but before summer rolls around we will be reinforced by 1500 new Coke ovens, which will temporarily, any way, make us independent of outside districts.

There has been a change made in the ownership of the Austin-Bryan Plow Company at Ensley. The Empire Plow Works of Cleveland, Ohio, have purchased the works and will operate them. The consideration is reported at $200,000. A good deal of interest is felt concerning the intentions of the Pressed Steel Car Company. Inquiry at their offices here resulted only in ascertaining the fact that they had not yet matured their plans. So they may or may not build a plant here.

The output of the Steel mill for last month showed an improvement over the preceding month, attesting the efficiency in management. It has not yet reached the maximum of its capacity. As a rule, furnace practice continues good. There has been a limited shutting down in some few instances, but the inconvenience was of no moment, and only temporary.

On the 1st inst. the State of Alabama turned over her convicts to work under State supervision to the successful bidders for their labor. The only change it will bring may possibly be somewhat better treatment. The output of coal will be about the same.

## Cleveland.

CLEVELAND, OHIO, January 6, 1903.

**Iron Ore.**—Estimates are now being made of the new tonnage under order with the lake shipyards, which show that the increased carrying capacity during the next year will equal 4,500,000 tons for a given season. This takes in the boats which have been turned out since the close of the season of navigation and all of those which will be launched during the present year. Much of this tonnage will be in service only a part of the season. It is estimated that the available increased tonnage this year will be 3,000,000 tons carrying capacity for the season. During the past season boats were a drug on the market, but the estimates which are being made in the Iron and Steel industry indicate that the shipment of Ore during the coming season will be vastly in excess of what it has been the past year, there being so many new furnaces to feed. The conditions in the other lake trades appear to demand a much larger carrying capacity during the coming year, and in consequence that amount of tonnage will be withdrawn from the Ore trade. These matters are taken into account by both the shippers and the vessel owners, with the result that preparations are being made for the payment of higher rates of freight during the season. During the past week the Pittsburgh Steamship Company, the lake arm of the Steel Corporation, have agreed with their engineers, and unless difficulties develop later with the longshoremen, which are not expected, the lakes will again be free of labor troubles.

**Pig Iron.**—Furnace owners are making strenuous efforts to improve their supply of Coke during the first half of this year. The effort has been as far as possible to get the furnaces supplied from ovens located on their line of railroad, so that the shipments may be more direct and therefore more expeditious. Changed relations naturally are working somewhat better than the old ones did, and for the time being there is a better supply of Coke. The railroad men in this section give no hope that this better shipment will continue for any length of time. They deplore the insufficiency of their equipment, but claim, under the circumstances, that it is inevitable. The situation in the foundry grades presents an interesting phase of the market. The material which could not be delivered the last quarter of last year, and that which has been bought for the first quarter delivery of this year, will keep the stacks employed. It is evident, however, that if some of the furnaces did not have to fill old orders they would be looking for business. As it is, there is a good deal of buying for the second quarter delivery, which is still to be done. Prices have not changed from $23 for No. 2, Valley furnace, for first half delivery and $21 for the same grade for second half delivery. The Basic producers are hopeful now of having some Iron for second quarter delivery, but the amount will not be large. Their production has been better of late. No price is named, but $21 is nominal, at least. The Bessemer producers are asking $23 for first half delivery at the furnace.

**Finished Iron and Steel.**—The long expected better demand for Bars of every description seems about at hand. The sales during the past week were quite heavy, including at least one order amounting to 1000 tons. The agricultural implement works are now beginning to buy Bars and other consumers have also shown a better feeling. Bar prices continue to be 1.60c., Pittsburgh, for Bessemer Steel and 1.70c. for Open Hearth Steel, while Bar Iron is variously quoted at 1.70c. to 1.80c., Pittsburgh, with the understanding that any of these prices might be shaded on good specifications. The Structural market continues active, with much interest being displayed in the possible production of the larger mills. The larger contractors are depending in a great degree upon them, wishing to avoid the premiums charged by the smaller mills if possible. It must be confessed that the smaller mills are finding rather poor picking for the time being, for while orders are coming in with some degree of freedom, for the time being there is not a very great demand for quickly shipped material. The lull is expected to be temporary only. Smaller mills are quoting 1.75c. to 1.85c. at the mill, while the jobbers are getting 2.25c. The larger mills adhere to the quotation of 1.60c., Pittsburgh. The Plate trade appears to be strong but not rampant. The market is firm with good specifications on old orders and new ones coming in with moderation. The mills appear to have about all they care to do for the present and are well enough stocked with orders to care very little about the future. The smaller mills see enough business ahead of them to reassure them on their price-list. These mills are getting 2c. at the mill and seem to have a good deal of business. The larger mills adhere to the quotation of 1.60c., Pittsburgh. The Sheet trade has brightened up some. The market, however, is not entirely free of the possibility of a too great producing capacity for the first half delivery. For the time being business is being done on the old list of prices of 3.10c. to 3.25c. for No. 27 out of stock and 2.85c. to 2.95c. at the mills. Galvanized Sheets are bringing 3.70c. for No. 27. The demand for Billets appears to be better than the supply and the market is strong at $30 for Bessemer, Pittsburgh. The inquiry for Rails has continued and it is expected that some considerable sales will be made within the next few weeks.

**Old Material.**—The demand for Scrap is at a very low ebb just now, which is not easily explained. The feeling generally is that prices are on too high a level and a process of general reduction will soon be undergone for which preparations are now being made. For the time being, however, the prices remain as follows: No. 1 Wrought, $19, net; Iron Rails, $25.50, gross; Iron Axles, $28, net; Cast Borings, $12, gross; Car Wheels, $22.50, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $20, gross.

## St. Louis.

CHEMICAL BUILDING, January 7, 1903.—(*By Telegraph.*)

**Pig Iron.**—The Pig Iron trade here has undergone no new changes of importance since last reported. The entrance into the new year is marked by a very satisfactory and firm tone, and sales agents hardly look for any increase in the special activity in the market for some weeks, when buyers will be calling for requirements for delivery during the second half. Offerings are comparatively light for the first half, and there is very little Iron that is up for sale but what finds a ready buyer. We make no change in our prices, and quote, f.o.b. St. Louis:

| | |
|---|---|
| Southern, No. 1 Foundry | $24.25 to $25.25 |
| Southern, No. 2 Foundry | 23.25 to 24.25 |
| Southern, No. 3 Foundry | 22.75 to 23.75 |
| Southern, No. 4 Foundry | 22.25 to 23.25 |
| No. 1 Soft | 24.25 to 25.25 |
| No. 2 Soft | 23.25 to 24.25 |
| Gray Forge | 22.25 to 23.25 |
| Southern Car Wheel | 29.00 to 30.00 |
| Malleable Bessemer | 25.75 to 26.25 |
| Ohio Silvery, 8 per cent. Silicon | 31.00 to 32.00 |
| Ohio Strong Softeners, No. 1 | .... to .... |
| Ohio Strong Softeners, No. 2 | .... to .... |

**Bars.**—Iron and Steel Bars are reported to be a very salable commodity by the jobbing trade, and demand and inquiry continue in very good volume. We quote from the mills: Iron Bars at 1.80c. to 1.90c. and Steel Bars at 1.80c. to 1.85c. Jobbers quote Iron Bars at 2.25c. and Steel Bars at 2.25c. in small lots from store, with 2.15c. in large quantities.

**Rails and Track Supplies.**—The turn of the new year marks no change in the conditions ruling in the market for Rails and Track Supplies, and any decline in the present demand is hardly to be looked for for a considerable time to come. We quote as follows: Splice Bars at 2.05c.; Bolts, with Hexagon Nuts, 3.15c. to 3.35c.; with Square Nuts, 3c. to 3.10c.; Spikes, 2.25c. to 2.50c.

**Angles and Channels.**—The demand is good, and a fair amount of new inquiry is constantly coming up on the jobbers for Small Angles and Channels, and quotations show no change, and for material of this class 2.50c., base, is asked.

**Pig Lead.**—Little if any change in trade conditions in the Pig Lead market is to be noted, and the demand is referred to as being of very moderate proportions, with prices showing firmness. We quote Chemical at 3.97½c. to 4c. and Desilverized at 4c. to 4.05c.

**Spelter.**—Prices hold fairly well around present basis, and the demand, while not heavy, is in very fair volume. Buyers seem not anxious to commit themselves, while prices show inclination to wide fluctuation. We quote 4.40c. to 4.45c.

## Cincinnati.

FIFTH AND MAIN STS., January 7, 1903.—(*By Telegraph.*)

The new year starts with a much steadier and even stronger feeling in the Pig Iron market than was noticeable during the last weeks of December. The change is more appreciable in the lower grades than in the remainder of the list. It has been a well known fact that for the last few months Mill Irons and No. 4 Foundry have been the weak spots in the market. Recently some very low quotations have been named and disputed. It was a fact that for several weeks Gray Forge has been openly offered at $15.50, Birmingham. This Iron has disappeared from the market, and while the figures at which it was taken and the amounts sold cannot be obtained, it is now evident that whatever there was in the way of accumulation of this grade has been quietly taken up, and as a result the quotation has slipped back to what is regarded as normal position. With reference to Foundry Iron, there appears to be a general understanding that $17.50 is now to be regarded as the standard price. It is known that a proposition to buy 1000 tons at $16, Birmingham, has been pretty generally turned down. Under a moderate demand for No. 4 Foundry that grade has also strengthened itself, and now, while transactions are seasonably limited and the market is exceedingly quiet, the tone is very firm and in favor of sellers all the way round. There is as yet no interest shown in last half deliveries and the quotations remain normal on the basis of $18, Birmingham, for No. 2 Foundry. Freight rate from the Hanging

Rock district $1.10 and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for delivery to July 1, 1903, freight rates only guaranteed to March 1, as follows:

| | |
|---|---|
| Southern Coke, No. 1 | $22.75 to $24.00 |
| Southern Coke, No. 2 | 21.75 to 23.00 |
| Southern Coke, No. 3 | 20.75 to 21.75 |
| Southern Coke, No. 4 | 20.75 to 21.25 |
| Southern Coke, No. 1 Soft | 22.75 to 24.00 |
| Southern Coke, No. 2 Soft | 21.75 to 23.00 |
| Southern Coke, Gray Forge | 20.75 to 21.25 |
| Southern Coke, Mottled | 20.75 to 21.25 |
| Ohio Silvery, No. 1 | 30.60 to 32.10 |
| Lake Superior Coke, No. 1 | 25.10 to 26.10 |
| Lake Superior Coke, No. 2 | 24.10 to 25.10 |
| Lake Superior Coke, No. 3 | 23.10 to 24.10 |
| *Car Wheel and Malleable Irons.* | |
| Standard Southern Car Wheel | $27.75 to $28.75 |
| Lake Superior Car Wheel and Malleable | 27.50 to 28.50 |

**Plates and Bars.**—The market is quiet and unchanged. We quote, f.o.b., as follows: Iron Bars in carload lots, 1.92c., with half extras; same, small lots, 2.20c., full extras; Steel Bars, carload lots, 1.72c., with half extras; same, small lots, 2.20c., full extras. Plates are quoted nominally, ¼-inch, in carloads, 1.70c.; same, 3-16, 1.80c. As a matter of fact, however, mills having Plates to ship are getting 2.15c. without trouble. I-Beams and Channels, 1.70c., base. All prices f.o.b. Cincinnati.

**Old Material.**—We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $19.50 to $20 per net ton; Cast Scrap, $16.50 to $17 per net ton; Iron Rails, $24.50 to $25, gross; Steel Rails, long, $23.50, gross; same, short, $18, gross; Iron Axles, $26.50 to $27, net ton; Car Wheels, $21, gross.

The announcement is made that the Hickman-Williams Company of Louisville will open a branch office in this city February 1. W. G. Eaton will be in charge.

## German Iron Market.

ESSEN, December 17, 1902.

Since our last report the situation has not completely cleared. Heavy exports continue undiminished, but we cannot record any animation in the home markets. The Siegen Pig Iron syndicate, whose expiration was referred to in the last report, has been revived and in this manner the continued existence of the other Pig Iron syndicates, at one time threatened, is now assured. The Steel Rail syndicate has also been extended to the end of 1903, and with it the corresponding syndicates for other railroad material like Sleepers, Tires and Wheel Centers.

There has been very little business in Iron Ores, in spite of the fact that the Siegen district has reduced the price for calcined spathic Ore to 14 marks per ton. Red Hematites from the Nassau district are freely offered without meeting with a demand. Minette and foreign Iron Ores are unchanged.

In Pig Iron large export sales have been made, notably for foundry iron, including transactions with the United States. One of the directors of the syndicate has gone to the United States in order to study the markets there. Very little is being bought for the home market, the only quantities involved being additions to old contracts. Official prices are: Spiegeleisen, 10 to 12 per cent. Manganese, 68 marks per ton, f.o.b. Siegen; Special Mill Iron, 58 marks, f.o.b. Siegen; Thomas Basic Pig, 57 marks, delivered consumer's works. No. 1 Foundry Iron, 65 marks; No. 3, 61 marks; Bessemer, 65 to 66 marks, f.o.b. furnace. Luxemburg Mill Iron, 46 marks; Luxemburg Foundry Iron, 49 to 50 marks, f.o.b. Luxemburg.

So far as Steel is concerned purchasers are halting. The syndicate has determined to maintain present prices for the next quarter, the figures being 77.50 marks for Ingots and Heavy Blooms, 82.50 marks for Blooms and Heavy Billets, 90 marks for ordinary Billets about 50 mm. square, and 92.50 marks for Slabs, f.o.b. Dortmund, Siegen, Ruhrort, Rothe Erde and Diedenhofen, with extras for special quality and special sizes.

The Bar Iron business is very much depressed since the official minimum price of 115 marks for Steel Bars could not be maintained and the market was declared free. Prices as the result of sharp competition have declined to 100 marks. It will be recognized that this is not a remunerative business when Billets are 90 marks plus freight. Conditions are quite similar in the band and hoop business, the rolling mills having no Steel plant or furnaces being in a particularly serious position. Few changes have occurred in the Rail market. The Prussian Minister of Railroads, however, is reported to be planning the placing of an order of 50,000 tons in addition to the regular yearly contracts in order to help the Steel industry. It is stated that the extra tonnage will consist of Goliath Rails. At the present time negotiations are pending between the minister and the Rail syndicate. There is a good deal of work for export Rails and larger transactions have been recently closed. In Girder Rails, however, business is bad. Mine Rails are quoted 100 marks; Light Sections, 110 to 112.50 marks; Standard Sections, 117.50 to 120 marks; Girder Rails, 135 to 140 marks. Since the winter has set in sharply and building has been interrupted the Beam business has been very quiet. Tubes and Wire are very weak. It is only occasionally that new work is received in Sheets, but the volume is not sufficient to keep the mills fairly well employed.

## The Belgian Iron Market.

BRUSSELS, December 15, 1902.

No improvement has yet been felt in our metallurgical markets, the crisis continuing and growing even graver. The enormous overproduction of the German mills, and more particularly of those in the Rhenish Westphalian districts, is too great to be taken care of in that country. It is therefore thrown upon the international market at prices ridiculously low, and this makes it impossible for our works to flourish. As a matter of fact Coal in Belgium costs relatively more than in Germany, and costs are much higher. Since we must export about three-quarters of our product this would be impossible if the works adhered arbitrarily to certain prices. They are therefore compelled to quote figures below cost prices, and to submit to the loss. The following table clearly indicates this:

*Cost of Production of Pig Iron Per Ton.*

| | Francs. |
|---|---|
| Ore, 3000 kg., at 8½ francs per ton | 25.50 |
| Coke, 1200 to 1300 kg., at 18 francs per ton | 22.50 |
| Labor and miscellaneous | 8.00 |
| Total cost | 56.00 |

Now as a matter of fact Mill Iron has sold for a long time at 50 francs, and it is only due to the heavy purchases made for the United States that this price has been carried up to 57 francs.

Assuming the average cost of Coal delivered to the puddle mills to be 16 francs, we have:

*Cost of Production of Muck Bar.*

| | Francs. |
|---|---|
| Pig Iron, 1160 kg., at 57 francs | 66.12 |
| Coal, 1000 kg., at 16 francs | 16.00 |
| Labor and miscellaneous | 12.40 |
| Total | 94.52 |

Now as a matter of fact Bars have sold at 91 francs and even down to 90 francs. There is therefore a considerable loss. On finished products we have the following figures:

| | Francs. |
|---|---|
| Muck Bar, 1120 kg., at 93 francs | 104.16 |
| Coal, 650 kg., at 16 francs | 10.40 |
| Labor and miscellaneous | 11.80 |
| Total | 126.36 |

As a matter of fact No. 2 Bars are selling at a maximum of 125 francs. On these the cost of Muck Bars has been put down at 90 francs. In reality they cost the producer 94.52 francs, because I have desired to take into account those Muck Bars which can be purchased at 90 and 95 francs, coming chiefly from Germany. In other words, I have taken an average.

The situation being as described, the mill owners have been forced to reduce wages from 5 to 10 per cent., and will probably not stop there. Blooms, which had fallen 2 francs per ton, have again been raised to 93 francs as the result of the demand from America.

So far as Old Material is concerned it has become more abundant at 67.50 to 70 francs for good quality.

As for Finished Material it is more particularly the larger sizes of Shapes which are in a bad position. At home we are in the dead season, more particularly during the last two weeks, since the construction work is stopped, and the time of taking inventories approaches. Orders might be taken for Merchant Shapes, but at £4 17s. and £4 18s., a price altogether too low. Dealers are inclined to offer business to our rolling mills for future delivery, but the works do not care to entertain them at prices as low as they are.

In the building trade the situation has not improved. Latterly some pretty large orders have been taken for Russia, as generally it is a fact that the majority of foreign consumers apply only to the Germans in this line. For export, No. 2 Plates are quoted £5 10s. for Iron and £5 14s. for Steel per ton, f.o.b. Antwerp, for specifications for ⅛-inch Plates and upward, provided they do not include more than 35 per cent. of ¼-inch Plates. For the home market the prices are 137.50 to 140 francs for Iron and 142.50 to 145 francs for Steel Plates No. 2, but concessions are made from these figures.

In the Rail trade there is continued activity, and all the rolling mills of the Liege district which are in this branch are well supplied with orders, particularly from America.

The works running on small sizes have no occasion to rejoice, and complain bitterly of the German competition. The best that can be obtained for Wire Rods is £5 8s. to £5 10s., f.o.b. Antwerp, and Nails, 13.60 to 13.70 francs per 100 kg., f.o.b. mills. For Iron Rods orders are being hunted for at about 13.25 francs per 100 kg., f.o.b. Antwerp.

Generally speaking the construction shops have little work. One of the largest companies in the Liege district

who generally are well situated to secure work have almost nothing to do. Another shop in the same district which was about to dismiss its working force and close its doors, owing to lack of work, luckily received an order for a theater for America at the last moment.

The Bolt works complain of absence of demand. Their German and Dutch competitors have carried off nearly all the orders recently arising in Holland, and the French take a good share of the orders for export, notably for those for Spain, where they have secured a good deal of work at very low prices, however. The Wire Nail Syndicate wants more orders.

In Steel Castings the situation is very difficult. Too many works have been built for this specialty, and they suffer seriously. During the last year and a half Steel Castings have declined 50 per cent.

Our Chain makers are living from day to day, so that generally speaking the metallurgical industry of Belgium is passing through an exceedingly difficult period, and with very discouraging prospects.

## New York.

NEW YORK, January 7, 1903.

**Pig Iron.**—As is natural during this season of the year, buying has been light, but prices are steady. So far as we can learn there has been very little additional purchasing of foreign Iron for importation, although the prices for foreign Pig Iron continue below the equivalent of domestic brands. A very large part of the foreign Pig is purchased by analysis, which, however, foreign makers will not guarantee. We quote for prompt to early delivery: Northern Iron, at tidewater, No. 1 X Foundry, $24.50 to $25; No. 2 X Foundry, $22.25 to $22.75; No. 2 Plain, $21.50 to $21.75. Tennessee and Alabama brands, in New York and vicinity: No. 1 Foundry, $24 to $25; No. 2 Foundry, $22.75 to $24; No. 3 Foundry, $21.75 to $22.50.

**Cast Iron Pipe.**—The disposition among municipalities to contract for their summer requirements is not diminishing, but more of them are asking for bids. The name of the successful bidder on the Brooklyn contract has not yet been made public. Prices do not look so firm as a short time since, probably owing to the purchase of cheaper foreign Iron by some of the foundries. Prices, tidewater, rule at about $34, gross ton, for 6 to 12 inch.

**Steel Rails.**—No sales of any consequence are reported, although new inquiries continue to come into the market, both for domestic and foreign Rails. We continue to quote $28, at Eastern mill, for Standard Sections.

**Finished Iron and Steel.**—Little of interest in the matter of tonnage has developed in this market, but from another standpoint the placing of a 750-ton contract for an Idaho beet sugar factory with the American Bridge Company is worth mentioning. The company have taken quite a number of contracts of this character in several Western States. They begin the new year well pleased with the conditions prevailing, and are in better position than ever to take care of their trade. Plates are in demand, with a large tonnage soon to come on the market, but the mills are still suffering from lack of Coal. We quote at tidewater as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates are 2.10c. for Tank, 2.20c. for Flange, 2.35c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.80c. to 1.90c. Foreign Beams are 1.75c., ex-ship, New York, in large lots.

**Old Material.**—Consumers are gradually getting into the market, and sales of moderate size are being made. Buyers who have done nothing for months are not only making inquiries, but are taking some material conservatively. Prices are therefore firmly held. We quote, f.o.b. cars, vicinity of New York, per gross ton:

| | |
|---|---|
| Old Iron Rails | $22.50 to $23.00 |
| Old Steel Rails, long lengths | 20.00 to 20.50 |
| Old Steel Rails, short pieces | 18.00 to 18.50 |
| Relaying Rails, heavy sections | 29.00 to 30.00 |
| Relaying Rails, lighter sections | 32.00 to 33.00 |
| Old Car Wheels | 20.25 to 20.75 |
| Old Iron Axles | 25.50 to 26.00 |
| Old Steel Car Axles | 24.50 to 25.00 |
| Heavy Melting Steel Scrap | 18.00 to 18.50 |
| No. 1 Railroad Wrought Scrap Iron | 21.00 to 21.50 |
| Track Scrap | 18.00 to 18.50 |
| Busheling Scrap | 14.00 to 14.50 |
| No. 1 Machinery Cast Scrap | 19.00 to 20.00 |
| Stove Plate | 13.00 to 14.00 |
| Wrought Turnings, delivered at mill | 16.50 to 17.00 |
| Cast Borings, delivered at mill | 9.00 to 9.50 |

**Clairton Steel Company.**—PITTSBURGH, PA., January 7, 1903.—*(By Telegraph.)*—Some excellent records for production are being made at the new open hearth plant of the Clairton Steel Company at Clairton, Pa. Nine 50-ton open hearth furnaces are in operation and on Monday, January 5, 907 tons of steel were turned out, while on the following day the output was 945 tons. When it is remembered that this is a new plant and that there is considerable difficulty in getting prompt deliveries of fuel and raw material, these records for output are certainly very creditable. It is expected that within a short time the other three furnaces at this plant will be started, giving a complement of 12 of 50 tons capacity each.

## Iron and Industrial Stocks.

A sharp revival in the demand for stocks was experienced the past week. Lower rates for money and the passage of the last week of December without a tremor in financial circles caused a feeling of buoyancy in speculative circles. Interest and dividend money disbursed the opening days of this month sought favorable opportunities for investment, and the low prices of industrials were tempting. The transactions ran up to larger figures than had been seen in a long time, and advances were made on nearly every stock traded in. Can preferred advanced from 47½ to 51⅛, Car & Foundry common 35½ to 39¼, preferred 91 to 93; Enameling preferred 80 to 85, Pressed Steel common 61 to 64¾, Sloss-Sheffield common 58 to 62½, Tennessee 59¼ to 65, United States Steel common 35¾ to 38⅝, preferred 85⅜ to 89¼. Some stocks, such as Car & Foundry common and Pressed Steel Car common, were advanced on reports of an increase in the rate of dividend.

W. A. Myler, treasurer of the Standard Sanitary Mfg. Company, Arrott Building, Pittsburgh, announces that coupons, due on and after January 1 will be paid on presentation to the Pittsburgh National Bank of Commerce.

The directors of the United States Oil & Gas Well Supply Company of Pittsburgh have decided to increase the capital stock from $200,000 to $400,000, fully paid up. This concern have had a very heavy increase in their business in the past 18 months, and are filling a large order for supplies for shipment to the gold fields of Alaska.

**Dividends.**—The Susquehanna Iron & Steel Company have declared a dividend of 3 per cent., payable January 26.

The Rock Run Fuel Gas Company of Pittsburgh have declared the regular quarterly dividend of 1¾ per cent. on the preferred capital stock.

The directors of the Monongahela River Consolidated Coal & Coke Company of Pittsburgh have declared the regular semiannual dividend of 3½ per cent. on the preferred stock, payable January 21.

The Pittsburgh Malleable Iron Company of Pittsburgh have declared the regular quarterly dividend of 2½ per cent., payable January 10.

The directors of the Pressed Steel Car Company of Pittsburgh will meet during the third week in this month to take action on the common stock dividend. During the first year the company paid 6 per cent. on the common stock. In January, 1901, the rate was reduced to 4 per cent. per annum, and this was paid during 1901 and 1902. It is stated that at the meeting this month the rate will again be advanced to 6 per cent. per annum.

The American Car & Foundry Company have declared a dividend of 1¾ per cent. on the preferred stock, payable February 2, and a dividend of 1 per cent. on the common stock, payable February 2, to holders of record January 10.

The directors of the Harbison-Walker Refractories Company of Pittsburgh have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable January 20.

The Standard Underground Cable Company of Pittsburgh have declared the regular quarterly dividend of 2 per cent. and an extra dividend of 2 per cent., payable January 10. The distribution amounts to about $80,000.

The United States Steel Corporation have declared the regular quarterly dividends of 1¾ per cent. on the preferred and 1 per cent. on the common stock. The transfer books close as to the preferred stock on January 20 and open February 17, and as to the common stock the books close March 16 and open April 21.

The heirs of David Griffing and Asa Sheldon of Norwich, N. Y., one of whom is Arthur Griffing Sherman of New York, have recently instituted suit in Chancery Court at Sparta, Tenn., against the Bon Air Coal & Iron Company for 3000 acres of coal lands, recently opened at Ravenscroft, Tenn. It is alleged that the Coal Company have never purchased the title to the property, but only bought from parties who had claimed to be in possession of the land of recent years.

Edward L. Leeds of London, the European representative of the Brown Hoisting Machinery Company of Cleveland, Ohio, is visiting this country on business in connection with some important contracts for cranes, &c., to be installed in British plants.

# Metal Market.

NEW YORK, January 7, 1903.

**Pig Tin.**—Lively buying, both here and abroad, by the present bull element has sent prices upward with rapidity during the last week. A slight cessation in the buying movement through the last few hours caused a rapid reaction. At this writing prices are a little higher than midway between the quotations of a week ago and yesterday. The market closed weak to-day. The movement was particularly in futures, where almost all of the speculative trading was being done. The spot figure naturally followed upward. The highest point, which was reached yesterday, was 28c. for spot and futures. In London £126 5s. was reached for spot, and futures went up to £126 17s. 6d. At the opening of business here this morning London fell £1 and by the close spot declined to £124 15s. and futures £125. The closing price here was 27¼c. to 27½c., for any delivery until next May. There was a good deal of wild talk on 'Change yesterday, some brokers saying that the price here would go to 40c. Some of these brokers who are leading the bull movement were most radical bears when the price was in the neighborhood of 24c. The monthly statistics of the New York Metal Exchange show:

| | Tons. |
|---|---|
| Arrivals at the Atlantic ports amounted to | 3,012 |
| Total arrivals since January 1, 1902 | 35,691 |
| Of which from Straits by direct steamers | 14,946 |
| Of which from United Kingdom | 17,657 |
| Of which from Holland | 1,574 |
| Of which from European Continent | 1,514 |
| The deliveries for December we figure as | 2,600 |
| Total deliveries since January, 1902 | 33,900 |
| The shipments from Straits amounted to | 3,895 |
| Against previous month | 4,350 |
| Against December, 1901 | 4,150 |
| Australia shipped | 256 |
| Against previous month | 313 |
| Against December, 1901 | 282 |

Statistics for the United States—Pacific ports excluded—December 31, show as follows:

| | Tons. |
|---|---|
| Stocks, December 29, including on dock and vessels | 4,122 |
| Afloat | 2,870 |
| Total | 6,992 |

The total statistics for Europe and the United States show:

| | Tons. |
|---|---|
| Total visible supply December 31, 1902 | 16,769 |
| Against visible supply November 30, 1902 | 18,346 |
| Against visible supply December 31, 1901 | 17,018 |

**Copper.**—The movement in this market was identical with that of the Tin market throughout the last week. Until yesterday's close prices soared. Before the close today they had receded considerably. The movement was most pronounced in London, where they succeeded in putting up prices to £54 3s. 9d. yesterday morning. This is an advance of more than £1 as compared with last week. The price here yesterday was advanced to 12.20c. to 12.40c. on spot and 12.10c. to 12.30c. on Electrolytic. To-day the closing prices here were 12c. to 12.37½c. for Lake, 12c. to 12.20c. for Electrolytic and Casting, and 11¼c. to 11½c. for Standard. The London market closed £53 1s. 3d. for spot and £53 8s. 9d. for futures. Sellers in this market reported a large business, which could not, however, be traced, and as far as we can learn sales were only moderate and the competition in making them was very keen. The annual statistics of the New York Metal Exchange, which we print below, show that despite the great consumption in this country last year and the heavy exportation the stocks at hand at the close of the year are barely 3000 tons less than they were last year. Considering that in the first six months of the year our stocks decreased about 6000 tons per month, it is apparent that during the last six months this shrinkage was counterbalanced by an accumulation.

*United States Statistics of Copper.—Compiled in Long Tons by C. Mayer, Secretary New York Metal Exchange.*

| | Supplies. 1902. | 1901. | 1900. | 1899. | 1898. |
|---|---|---|---|---|---|
| Domestic production | 293,830 | 266,716 | 270,588 | 261,313 | 235,050 |
| Net importations of foreign | 74,927 | 61,286 | 38,182 | 39,858 | 12,900 |
| Total supplies | 368,757 | 328,002 | 308,770 | 301,171 | 247,950 |
| | Exportations. | | | | |
| To Europe | *164,266 | 92,908 | 151,988 | 112,637 | 132,419 |
| To British North America | 704 | 616 | 688 | 435 | 700 |
| To Mexico | 65 | 85 | 151 | 130 | 200 |
| Contents of sulphate | 3,400 | 5,332 | 4,025 | 2,392 | 1,062 |
| Total exportation | 168.435 | 98,941 | 156,852 | 115.594 | 134.381 |
| | Consumption. | | | | |
| Estimated home consumption | 203,000 | 165,000 | 150,000 | 162,000 | 114,000 |
| | Stocks at End of Year. | | | | |
| Stocks include stocks at the mines, on transportation, at refineries and in warehouses | 133,813 | 136,491 | 72,430 | 70,512 | 46,935 |

* These figures include 1026 tons to Asia, Africa, Australia and South America.

**Pig Lead.**—The only change to be noted is an advance of 5 shillings in London, where the price quoted to-day is £11 1s. 3d. In this market the official quotations of 4.10c. for futures and 4.12½c. for spot are still held to.

**Spelter.**—There is a slight improvement to be seen here and in St. Louis. The change came over the market yesterday when spot here advanced to 4.70c. from 4.62½c. The St. Louis market is said to be 4.50c. London is unchanged at £19 17s. 6d.

**Antimony**—Is lower. Cookson's is quoted at 8¼c. to 8½c., Hallett's at 7c. to 7¼c. and other brands at 6½c. to 6¾c.

**Nickel.**—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

**Quicksilver.**—The market is quiet and unchanged, the ruling quotations being $48 per flask of 76½ lbs. each in lots of 50 flasks or more. London is unchanged at £8 15s.

**Tin Plate.**—Quotations are unchanged, being based on present official prices of $3.60 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, and $3.79, New York delivery. These prices, it is understood in the trade, will hold until April. The Swansea market is quoted 11 shillings 9 pence.

## December Fluctuations in Iron Stocks.

The following table shows the extent of transactions and the fluctuations in quotations of the stocks of iron and steel companies in the month of December, with the dates on which the highest and lowest prices on each stock were realized:

| Cap'l issued. | | Sales. | High- est. | Date. Dec. | Low- est. | Date. Dec. |
|---|---|---|---|---|---|---|
| $17,701,500 | Am. Bicycle Co., com. | 9,800 | 1¼ | 3 | ¼ | 31 |
| 9,294,900 | Am. Bicycle Co., pref. | 4,900 | 6 | 3 | 1½ | 30 |
| 9,500,000 | Am. Bicycle Co., bonds. | 71,000 | 45½ | 3 | 38 | 17 |
| 41,233,300 | Am. Can, com | 4,650 | 11 | 31 | 8½ | 17 |
| 41,233,300 | Am. Can, pref | 7,400 | 49½ | 31 | 41 | 15 |
| 29,000,000 | Am. Car & F'dry, com. | 24,600 | 36 | 31 | 32 | 12 |
| 29,000,000 | Am. Car & F'dry, pref. | 8,600 | 91½ | 31 | 86 | 12 |
| 24,100,000 | Am. Loco., com | 31,000 | 29½ | 31 | 23¼ | 12 |
| 25,000,000 | Am. Loco., pref | 7,300 | 95¾ | 31 | 90¾ | 4 |
| 45,000,000 | Cambria Steel | 29,750 | 27½ | 2 | 23 | 12 |
| 7,000,000 | Central Foundry, com. | 500 | 2¾ | 22 | 2½ | 24 |
| 7,000,000 | Central Foundry, pref. | 200 | 15 | 23 | 11 | 11 |
| 17,000,000 | Col. Fuel & Iron | 35,200 | 89 | 1 | 75 | 17 |
| 25,000,000 | Crucible Steel, com | 11,500 | 19¼ | 31 | 16 | 12 |
| 25,000,000 | Crucible Steel, pref | 9,075 | 85⅛ | 2 | 82½ | 12 |
| 1,975,000 | Diamond State Steel | 4,100 | 1¼ | 1 | ¾ | 31 |
| 2,368,100 | Empire I. & S., com | .... | 13 | 24 | 10½ | 31 |
| 2,281,400 | Empire I. & S., pref | .... | 43½ | 31 | 42 | 15 |
| 15,000,000 | Inter. Pump, com | 1,400 | 48½ | 10 | 43 | 16 |
| 8,850,000 | Inter. Pump, pref | 600 | 86 | 10 | 82 | 16 |
| 11,000,000 | Inter. Silver | 100 | 15 | 2 | 15 | 2 |
| 8,396,000 | Nat'l Enam., com | 2,000 | 35 | 2 | 31 | 16 |
| 15,441,800 | Nat'l Enamel., pref | 1,500 | 87 | 2 | 80 | 31 |
| 4,449,800 | Otis Elevator, com | 1,250 | 42½ | 31 | 38½ | 12 |
| 6,350,000 | Otis Elevator, pref | 500 | 100 | 16 | 97 | 30 |
| 16,500,000 | Pa., new, pref., Phila | 1,750 | 99 | 1 | 92 | 23 |
| 12,500,000 | Pressed Steel, com | 34,200 | 62 | 31 | 55 | 12 |
| 12,500,000 | Pressed Steel, pref | 6,150 | 93 | 31 | 89½ | 15 |
| 10,000,000 | Railway Spr., com | 6,100 | 35⅛ | 1 | 33⅛ | 18 |
| 10,000,000 | Railway Spr., pref | 4,700 | 89 | 4 | 85¾ | 11 |
| 27,191,000 | Rep. Iron & Steel, com. | 29,300 | 21 | 2 | 16⅞ | 12 |
| 20,306,900 | Rep. Iron & Steel, pref. | 16,000 | 78⅛ | 2 | 74¼ | 12 |
| 7,500,000 | Sloss-Shef. S. & I., com. | 7,400 | 59 | 31 | 54½ | 15 |
| 6,700,000 | Sloss-Shef. S. & I., pref. | 1,300 | 93 | 18 | 89 | 15 |
| 20,000,000 | Tennessee Coal & Iron. | 43,400 | 61 | 31 | 49½ | 12 |
| 1,500,000 | Tidewater Steel | 650 | 5¼ | 1 | 4¾ | 18 |
| 12,106,000 | U. S. C. Pipe, com | 8,000 | 14 | 2 | 11⅛ | 15 |
| 12,106,000 | U. S. C. Pipe, pref | 5,600 | 54 | 2 | 45 | 11 |
| 510,361,300 | U. S. Steel Co., com. | 780,500 | 37⅛ | 2 | 29¾ | 12 |
| 508,511,200 | U. S. Steel Co., pref. | 310,588 | 86 | 31 | 79 | 12 |
| 8,425,000 | Vir. Iron & Coal, com. | 9,220 | 39 | 1 | 32 | 13 |
| 10,000,000 | Vir. I. & C., 5 % bonds. | 319,000 | 71¾ | 3 | 69 | 31 |
| 1,500,000 | Warwick I. & S | 1,050 | 5¾ | 24 | 5 | 15 |

In the courts at Pittsburgh this week a decision was handed down on the bill of equity filed by the Pittsburgh Trolley Pole Company against the Pittsburgh Tubular Steel Whiffletree Company, deciding that the defendant company had infringed on a patent of the client, but the court refused to issue an injunction for the reason that since litigation had commenced the patent had expired. The court, however, ordered the defendant company to make an accounting.

Henry L. Hoff, a retired engine builder of Philadelphia, died January 3 at his home in that city, aged 80 years. He was born in Philadelphia and there learned the trade of mechanical engineer. During the Mexican War he served as an engineer in the United States Navy. He left the navy in 1853 and engaged in the business of manufacturing stationary engines as a member of the firm of Hoff, Fontaine & Abbott, proprietors of the Eagle Iron Works. The firm were dissolved in 1895.

## The New York Machinery Market.

NEW YORK, January 7, 1903.

It was not expected that the first week of the year would bring forth anything startling in the way of orders, and the unexpected did not happen. In small business there was, however, a notable increase, particularly as far as machine tools are concerned. Inquiry was very good, showing that purchasers are getting down to business. Several large projects have come to the surface. Altogether, the year opened up in good shape, and a feeling of increasing confidence prevails in the trade. The trade at large and particularly the machine tool branch have been keeping close tabs on the movements of the General Electric Company of late. Scarcely having finished enormous purchases for their Schenectady plant, this company are now bringing matters in shape for extensive purchases in connection with improvements being made at their plant at Lynn, Mass. We are authoritatively informed that at this point they are now erecting an extension to one building, 400 feet in length and 120 feet wide. A new building is under erection, 500 feet long and 120 feet wide. Both of these buildings are to be of steel construction, and are to be equipped with heavy and medium weight machine tools. An extension is also being built to one of the existing buildings of mill construction. This addition is to be 400 x 120 feet. Another improvement scheduled for Lynn is the erection of a new steel power plant. We understand that this plant is to be equipped with a large steam turbine of the company's make, and that provision will be made for adding other machines of this type, so that ultimately this new central turbine plant will generate all of the power required at the great works. The heavy purchases of machine tools recently consummated by the General Electric Company were for delivery at Schenectady, so the trade are now awaiting another large list for the fitting out of the new buildings at Lynn.

Improvements on a large scale are being prepared for by the De La Vergne Refrigerating Machine Company of Locust avenue and 138th street, New York City. As has been previously stated in the columns of *The Iron Age*, this company have an enormous amount of work underway in gas engines of large units for the Buffalo plant of the Lackawanna Steel Company. It is for facilitating the building of these engines that the improvements are to be made. A portion of the work has been started, but the greater portion is still open. The work now under way provides for the inclosure of a large open space between two of the buildings. A 20-ton Niles crane has been ordered for operating in this section of the works. A large amount of the machinery used in the building of refrigerating machinery is to be moved to this new part of the plant, and about $15,000 worth of new tools is to be installed. The principal addition will be the erection of a new brick building, 330 feet long and 120 feet wide. This building will have a center span of 60 feet and a 30-foot bay on each side. The foundations will be of concrete. The cost of the building alone is calculated to approximate $200,000. A heavy electric traveling crane will span the center of the shop at a hight of 50 feet from the floor. In the bays there will be lighter electric travelers and a system of jib cranes. One section of the shop is to be fitted out as a forge and blacksmith shop, and the remainder will be devoted to the building of heavy gas engines. The equipment to be purchased includes some of the heaviest types of machine tools built. For instance, we are informed that a 14 x 14 foot planer and a number of very large boring mills will be specified. In the present erecting shop a number of smaller or medium sized tools will be installed. The cost of the machinery to be purchased for the new building will probably foot up to $100,000. The specifications for these tools are now being prepared.

In connection with the purchases of the International Steam Pump Company for their Snow plant, at Buffalo, an order was placed within the last few days for the traveling cranes. It called for five cranes from 20 to 30 tons capacity each and was awarded to the Niles-Bement-Pond Company. It is expected that more of the machine tools will be ordered before the close of this week.

The Gruson Iron Works of Eddystone, Pa., are purchasing additional equipment. They are building a 200-foot extension to their foundry and have ordered a 30-ton three-motor Pawling and Harnischfeger crane and other equipment. Thomas Prosser, the American representative of the Krupp Works, is the president of this company. David Townsend of Philadelphia is general manager and Eugene Thalmann of the New York banking firm of Ladenburg, Thalmann & Co. is the chairman of the board. The company have a very large foundry capacity and a good sized machine shop. The trade expect soon to see a very large machine shop built at Eddystone.

The National Licorice Company, whose offices are at 375 Lorimer street, Brooklyn, are building a large new plant in Brooklyn. Preparations are now being made for purchasing the equipment for the power plant. A 500 horsepower outfit is to be bought. F. P. Scudder, the president of the company, is taking charge of this matter personally.

Thomas J. McKenna of 29 Broadway is negotiating for the purchase of a large foundry equipment. The machinery is to be installed in a new plant to be built at Trenton, N. J., by the Iron Pipe & Supply Company, a new incorporation, in which William S. D'Arcy, a member of the City Council of Trenton, is interested. A temporary office has been opened at 512 Perry street, Trenton, by the company. The power plant to be installed will be of from 250 to 300 horse-power. The company will engage in the manufacture of iron pipe castings of all sizes, beginning with a paid in capital of $100,000.

William F. Collins, who is stopping at the Hotel Albert, Eleventh street and University place, New York, and intends to retain headquarters there until the 12th instant, is looking up the brass and copper mill subject. Mr. Collins represents a large copper producing interest, who intend embarking in the brass and finished copper business. He is looking for information regarding the equipment of large mills, but is keeping the identity of his principals secret. After the 12th he can be reached by mail at Northampton, Mass.

Director of Works Isaac S. Taylor of the St. Louis Exposition has awarded to the Hanley-Casey Company of Chicago one of the largest contracts ever let for high pressure fire protection system. They will require 140,000 lineal feet of pipe from 6 to 24 inches, and 110,000 feet from 1 to 4 inches. This entire work will be connected up with extra heavy fittings, and to have 600 fire hydrants and 300 stand pipes, all automatically controlled. The entire system, when completed, will be tested to 300 pounds pressure per square inch. This work will be used for fire protection for all the World's Fair buildings. Each section will be separately controlled, and will be under complete control by the engineers at the pumping station. The water supply will be furnished by 14 high pressure fire protection pumps, each having a capacity of 1000 gallons per minute. This system will, no doubt, be one of the most complete fire protection systems ever furnished or constructed for fire protection for any exposition ever built. It is said that the entire plant, when completed, will cost about $800,000.

The Hanley-Casey Company have done much work on the World's Fair grounds, having laid some 40,000 feet of sewerage and about 30,000 feet of domestic water mains. This firm have achieved quite a reputation in exposition work, having done all the plumbing work for the Pan-American Exposition. In St. Louis they have received contracts for the plumbing and heating in the Fine Arts Building, which is to be a permanent structure, and have contracts up to date for eight large exhibit palaces now under course of construction.

Under the laws of the State of New York the New York Consolidated Die Company were incorporated last week with a capital of $100,000. The directors named are Abednego Dewes, John Dewes and R. W. Long of New York. The new company will manufacture dies used for cutting figures, shapes or designs from fibrous materials, such as paper, cloth, leather, rubber, &c., the proper manufacture of which requires a high degree of skill and judgment and long experience. The New York Consolidated Die Company have merged the business of A. Dewes, John Dewes & Son and the Marcus Hanan Company, all of New York City. Each of these firms are well-known to the trade throughout the country, having been in the business continuously for over 30 years. The consolidation is intended to enable users of these knives and dies to obtain a uniform quality of product at the minimum cost, and with a dispatch heretofore unknown in the business. A. Dewes will continue his machinery business as heretofore, and the Marcus Hanan Company will continue the manufacture of brass bound patterns for shoes, shirts, belts, &c., as heretofore. The new Die Company will take the plants of the old concerns into one factory at 243, 245 and 247 Centre street, New York City.

M. H. Treadwell & Co., 95-97 Liberty street, are finishing the installation of the industrial railway at the Spauldings & Jennings Works of the Crucible Steel Company of America, Jersey City. This installation is considered one of the largest of its kind in this section of the country. Over 1 mile of 21-inch track has been installed under roof. The equipment consists of 24 all steel cars, six all steel cars with wooden decks, and two steel cars of special construction and known as transfer turntables. They have also completed the installation of an industrial railway at the National Lead Works, Brooklyn. Treadwell & Co. have orders for ten slag cars for the American Smelting & Refining Company, six being for their Monterey plant, Monterey, Mexico, and four being for their Auguascalientes plant, Mexico. These cars will be equipped with electric apparatus for the propelling power. They have also orders from the Dominion Iron & Steel Company, for the Sydney Furnaces, Cape Breton, N. S., for a lot of 20-ton Treadwell hot metal cars of the improved design, and report a large business in the crane department, of which R. M. Dorsey, the general manager, is now in change, and John R. Morgan, recently with the Morgan Engineering Company, Alliance, Ohio, is chief engineer.

Henry C. Meyer, Jr., M.E., announces the removal of

his office from 21 Park row to 114 Liberty street, where he will practice his profession as consulting mechanical engineer, making a specialty of the design of steam power plants and the mechanical equipment of buildings.

**Catalogues Wanted.**—A. M. Crane & Co., Incorporated, The Rookery, Chicago, ask that manufacturers of machinery, tools and specialties send them their catalogues and discount sheets. The Crane firm have recently organized a mail order department and will publish a monthly stock and mill list. It is their purpose to arrange with leading manufacturers of specialties and tools to handle their products through this mail order department.

The Mississippi Valley Engineering & Supply Company, 609 Carleton Building, St. Louis, Mo., have just been organized, and are desirous of receiving catalogues from manufacturers in the following lines: Structural materials, power plants, pumps, electrical apparatus and hoisting apparatus.

## Boston Machinery Market.

BOSTON, MASS., January 3, 1903.

Despite many predictions of a dull December the machinery and machine tool business held up remarkably during the month, and the new year started in with something like a boom. Heavy inquiries—especially for machine tools—indicate an excellent business for January, and the dealers are feeling very well satisfied with the outlook for this year. The continued prosperity in this country had led to the starting of many new companies, and their demands coupled with increasing orders from old contracts cause a representative of one prominent firm to predict that there will soon be a delay in deliveries, owing to manufacturers being so flooded with orders that they cannot promptly meet the demand. There is a great demand for heavy machinery, the first few days of the year bringing many buyers into the market.

Most of the dealers report that their December business kept up to past years' average, but some declare that their books show an increase and that they failed to discover the Christmas dullness. One firm said that their customers apparently held back during the latter part of December, then came in in such numbers on the first and second days of January as to seriously interfere with inventory work. The demand certainly indicates that the present good conditions will continue for some time to come, and the New England machinery and machine tool dealers are expecting a prosperous year.

The New England agency of the Prentiss Tool & Supply Company, recently removed from 200 Franklin street to 145 Oliver street, corner of Purchase street, is gradually getting its show room into shape. It occupies the quarters formerly occupied by the United States Steel Company, which have been thoroughly renovated. The Prentiss Company propose to have tools in operation in their show room for the instruction of prospective customers. They have 125 feet of street window space, and this will allow a fine opportunity for display. Frank K. Moore, dealer in wood working machines, occupies a portion of the Oliver street side of the room, having moved from the corner of Oliver and High streets, and the Metropolitan Bolt Company also retain office room near the Purchase street entrance.

The Massachusetts Electric Companies, a corporation controlling most of the electric railways in Eastern Massachusetts, outside of Boston, are preparing plans for large power houses at Gloucester and Taunton, Mass.

Harvard College is to erect a fire proof office building, 11 stories high, on Broad street, between Central and Walter streets, in this city. Existing leases will delay the commencement of the work for a year or longer.

The Boston Suburban Electric Company have purchased 80,000 square feet of land in Waltham, Mass., on which they will erect a large central power house.

H. H. Dickey, heading a syndicate, has purchased A. F. Baumgarten's entire interest in both the Maryland Sheet & Steel Company and the Maryland Rail Company of Cumberland, Md., and at the election of officers held last week H. N. Taylor of N. & G. Taylor Company of Philadelphia was elected vice-president of the Maryland Sheet & Steel Company and Lewis G. Millholland was elected vice-president of the Maryland Rail Company, in lieu of Mr. Baumgarten.

At Pittsburgh last week the Carnegie Steel Company, Limited, filed a bill in equity against Jones & Laughlins, Limited, and the Jones & Laughlin Steel Company in the United States Circuit Court on the Jones mixer patent.

## PERSONAL.

J. C. Becker, superintendent of the Allegheny plant of the Pressed Steel Car Company, was presented by the employees with a gold watch and chain as a Christmas gift. S. A. Eagle, assistant superintendent of the same works, was presented with a silver service.

Harry D. Thompson has been appointed master mechanic of the Ohio Works of the National Steel Company, at Youngstown, Ohio, succeeding L. A. Treat, recently resigned.

A. F. Holliday, assistant secretary, treasurer and auditor of the Wheeling Natural Gas Company, has been promoted to the position of assistant general superintendent, a new office. F. C. Leslie, formerly bookkeeper, takes Mr. Holliday's old position.

Charles Crowther has resigned the superintendency of the blast furnace plant of the National Steel Company at Niles, Ohio. J. C. Barrett has been appointed to the position vacated by Mr. Crowther.

Louis Chavanne of the firm of Chavanne-Brum Freres, St. Chamond, France, and Axel Sahlin of Julian Kennedy, Sahlin & Co., Limited, London, England, are in this country on a business tour.

F. D. Havens has been appointed purchasing agent in charge of the material and supply department of the Louisiana & Arkansas Railway Company, with office at Texarkana, Ark.

Charles Bettendorf of Brussels, Belgium, principal shareholder of the Magnesite Company, Limited, Hungary, is now in New York, where he has opened offices at 87 Nassau street, with a view of introducing his magnesite in the American market.

W. C. Herron of Cincinnati, who has been a member of the firm of Rogers, Brown & Co., has disposed of his holdings to his former partners. Mr. Herron has been in bad health for some time. He will leave that city for a long European trip as soon as he has settled up his affairs. He will make no plans for future activity until he returns from this trip.

E. C. Smith, who has been with the Robert Field Company of Cincinnati, Ohio, for years, removes to St. Louis, where he will take charge of an office for the same company, to handle the pig iron product of the Sloss-Sheffield Iron & Steel Company's furnaces. William Wieman, who has also been one of the salesmen for the Robert Field Company, removes to Cleveland on January 15 to open an office there for the same company.

J. S. Strawn has resigned as secretary and treasurer of the West Penn Foundry & Machine Company, Avonmore, Pa., on account of ill health and has been succeeded by Charles Hately.

W. D. Sargent, president of the American Brake Shoe & Foundry Company, New York, who has been absent for the past month on a combined business and pleasure trip to England and the Continent, will arrive home the coming week on the "Ivernia" of the Cunard Line.

Hamilton Stewart Corwin of Boston, Mass., has been elected president of the Vaughan Machine Company, Peabody, Mass., in the place of George C. Vaughan, resigned.

James S. Stirling has resigned as superintendent of the foundry department of the Harlan & Hollingsworth Company to become vice-commissioner of the National Founders' Association.

Andrew Carnegie's famous Rectorial Address, delivered before the students in the University of St. Andrews last year, has been printed in attractive pamphlet form.

A very timely and thoughtful article has appeared in the *North American Review* for January, from the pen of Archer Brown of Rogers, Brown & Co., New York. It is entitled "Shall We Reduce the Iron and Steel Tariff?" Mr. Brown presents some very instructive figures collected by himself relative to wages paid abroad. Mr. Brown reaches the conclusion that "the iron and

steel schedules should be cut in two, but by a graduated scale, to avoid shock."

George C. Foote has succeeded Kenneth Robertson as manager of the Zenith Furnace, at Duluth, Minn.

R. S. Smith, president of the Union National Bank, has been elected a director of the Pittsburgh Steel Foundry, filling a vacancy caused by the recent death of John G. Stephenson. The officials of this company are Stewart Johnson, president; J. M. Lockhart, vice-president; A. Trump, secretary, and John B. Jackson, Harry Darlington, J. J. Donnell, William M. McKelvey and R. S. Smith, directors.

J. M. Warner, the Philadelphia representative of Rogers, Brown & Co., has been compelled by ill health to withdraw from the firm.

P. R. Jennings of the firm of Bruce & Cook, New York, has been elected one of the managing directors of the New York Board of Trade and Transportation.

Andrew Carnegie has offered to give the city of Philadelphia the sum of $1,500,000 toward the extension of its free library system.

C. H. Zehnder of New York goes to Philadelphia to take charge of the business in that city of Rogers, Brown & Co., pig iron and coke merchants. The headquarters of the Allegheny Ore & Iron Company and of the Victoria Coal & Coke Company, of whom he is president, will also be removed to Philadelphia. The entire Fifteenth street front of the twelfth floor of the new Pennsylvania Building, at Fifteenth and Chestnut streets, will be occupied by Rogers, Brown & Co., and the companies named.

## Latest Advices from Pittsburgh.

*(Special, by Telegraph.)*

PITTSBURGH, PA., January 7, 1903.—Moorhead Bros. & Co., operating the Vesuvius Iron & Nail Works, at Sharpsburg, near Pittsburgh, and manufacturers of plates and iron and steel skelp, have recently changed their 19-inch mill to a 20-inch mill, in order to roll wider sizes of grooved iron skelp, and have also recently installed two Cahill upright water tube boilers.

The new addition to the plant of the National Malleable Casting Company at Sharon, Pa., will probably be completed and put in operation in February. The main building will be 750 feet long and 300 feet wide. It is equipped with electric traveling cranes and other modern machinery. The new addition will about double the capacity of this plant in the manufacture of steel castings.

The new open hearth steel plant of the Sharon Steel Hoop Company at Sharon, Pa., will probably be ready for operation in March. It contains four 30-ton furnaces and two finishing mills. This company have been buying their supply of steel billets from the Sharon Steel Company, but will make their own steel when their new open hearth plant is finished.

A party of officials of the United States Steel Corporation inspected the large plant of the Sharon Steel Company at Sharon, Pa., on Tuesday, January 6. Included in the party were W. E. Corey, president of the Carnegie Steel Company; W. T. Graham, president of the American Tin Plate Company; George G. McMurtry, president of the American Sheet Steel Company; W. B. Shiller, president of the National Tube Company; Vice-President W. B. Dickson of the United States Steel Corporation; W. P. Palmer, president of the American Steel & Wire Company; Ex-Senator William Flinn, George W. Darr, president of the Sharon Steel Company, and several others. The object of the visit was to look over the works with a view of making recommendations in future operations. The Steel Corporation are considering a plan for conducting the affairs of the Sharon Steel Company independent of the other subsidiary companies.

George E. McCague, general freight agent of the Carnegie Steel Company at Pittsburgh, has gone to California and will later sail on an extended trip to Japan.

The American Steel & Wire Company exported nearly 6000 tons of wire and wire nails in December.

The Pittsburgh Structural Steel Company have been organized at Pittsburgh by a number of concerns interested in the building trade and by July 1 it is expected the new company will have a modern structural plant for assembling structural steel for buildings.

## Shenango Valley Iron Notes.

NEW CASTLE, PA., December 27, 1902.—Developments of the past week in the valley have been along the lines of improvement and expansion. It has been announced that the plant of the Shelby Tube Company at Greenville will be much enlarged and improved; that the Bessemer Railroad will likely be extended from some point between Greenville and Mercer to Sharon or South Sharon; that the plant of the Continental Iron Company at Wheatland, which is being operated by a receiver, is paying off its debt at the rate of $4000 to $5000 per month, and that the Marquis Limestone & Clay Company, at New Castle, have purchased $150,000 worth of limestone land near New Castle, this sum being given for about 150 acres. They have also an option on 90 acres more at about $1000 per acre.

While plants are being enlarged financial facilities are also expanding. A new bank or trust company is projected for Sharpsville, Pa. A national bank is projected for Wampum, Lawrence County, by M. S. Marquis, president of the Home Trust Company, of New Castle.

The work of the Pennsylvania lines on their Erie & Pittsburgh division, in laying an additional track, eliminating curves and generally improving the road, will continue steadily throughout the winter. The Bessemer Railroad is expending about $1,000,000 this winter around Greenville in improvements to track, buildings and equipment. The Pennsylvania & Mahoning Electric Railway will be double tracked at once from New Castle to Youngstown.

The seven-story office building being erected by the Lawrence Savings & Trust Company on Washington street, New Castle, is fast approaching completion, and is the highest and most ornate building in the city. It is brick and stone, with a structural steel frame work. The nine-story block of the Dollar Savings & Trust Company has been completed at Youngstown and is also a great credit to the city. These buildings are doubtless the beginning of improvements which will change the appearance of both cities very much.

The activity in iron production is causing new life to flow along the Mahoning and Shenango valleys. Travel seems to be fully double what it was five years ago. A better class of business buildings and dwellings is being erected in all the towns and collections are reported better in all lines of business.

## Bindley Merchandising Company.

The Bindley Merchandising Company of Pittsburgh have been granted a charter with a nominal capital of $1000. The directors are John Bindley, W. H. Cochrane and Edward J. Lloyd. The Bindley Merchandising Company are an identified interest of the Bindley Hardware Company, and the charter was taken out for the purpose of extending the operations of the former concern. Some time since mention was made in these columns of the fact that the Bindley Hardware Company would erect a very large warehouse in Pittsburgh. A contract for the superstructure, which will be of steel frame, has been placed with the American Bridge Company, and about 3000 tons of structural steel will be used in the building. When this warehouse has been completed it is the intention of the Bindley Hardware Company to carry some new lines, such as sheets, tin plate and other of the heavier forms of finished iron and steel. The original charter of the Bindley Hardware Company, granted in 1890, permitted that concern to manufacture, and the charter just granted to the Bindley Merchandising Company allows the concern to merchandise goods as well as manufacture them.

## Pacific Coast News.

SAN FRANCISCO, CAL., December 24, 1902.—There was a rumor afloat in this city about a week ago that the Pacific Coast Hardware and Metal Association had appointed a committee to go St. Louis to contest the question of rates between this city and Eastern points, as against St. Louis and Chicago. The committee was even named in the local papers, but the whole thing was owing to a misconception. Anyhow, the daily papers seldom get trade matters right at the start. The Pacific Coast jobbers, instead of going to St. Louis to contest anything of the kind, have after a fight lasting over two years obtained a most signal victory over the St. Louis and Chicago jobbers. On November 17 the Interstate Commerce Commission rendered a decision covering the points raised and sustaining the contention of our jobbers. The decision supports the claim that lower proportionate rates can be made to competing points that possess the benefit of water transportation, as also that a reasonable differential as between carload and less than carload lots may be made. And, although this is qualified slightly, the claim of the coast jobbers, on the whole, is sustained, and thus a wearying fight is to all intents and purposes at an end for good and all. On some of the 400 items which are affected by this decision, however, the Commission allows the Middle West jobbers to have a further hearing, and should they conclude to do so the Commission will meet in St. Louis in February to give them a chance. In that event no doubt the jobbers will be represented, but not otherwise. So the St. Louis jobbers must take the initiative in any further proceedings, which cannot affect the character of the principles laid down, but merely their application in particular instances.

There is invested by the jobbing houses of this city no less than $200,000,000 in this trade, while Portland has $75,000,000, and the coast, as a whole, not far from $400,000,000, so that there are vast interests at stake, as our jobbers regarded the attempt of those of the Middle West as simply an effort to drive them out of business. Of course, this could not be done, as we are now within 57 days of New York by water, but it would have made a great deal of trouble and seriously impaired the income of the railroads engaged in the business. The Middle West jobbers, if they had gained in every respect what they wished, would have saved about 50 cents per 100 pounds, which they could have added to their profits. Although this question affected all the jobbers of the coast it threatened the hardware jobbers especially, and they led all other lines of business in their opposition to it.

The imports of pig iron and structural iron and steel continue very heavy, and it is stated that not less than 60 vessels are engaged to load structural iron and steel as part of their cargoes from Antwerp and other ports to this city during the coming year. It is certain that there are 27 vessels laid on from Antwerp to this city at the present time. It is now getting to be like old times as far as our foreign business in these articles is concerned. This is all so much money lost to the city and State for the want of an iron or steel plant on San Francisco Bay. By the way, we are about to have a plant for the manufacture of steel pipe and castings on what is known as the estuary on Oakland city front. It will be established by Whitelaw, long known as engaged in the business of raising wrecked vessels here.

The exports of hardware, machinery, &c., have been fairly active during the month. The "Mohican," December 9, had pumping machinery valued at $844 for Honolulu; "The City of Sydney," December 13, had pipe valued at $2678 for Mexico and $23 for Central America. On the same date the "W. B. Flint," for Mahukona, had machinery valued at $1195. The "Queen" for Victoria, December 12, had machinery valued at $5787. On December 16 the "Nebraskan," for Honolulu, had machinery valued at $640; iron pipe, $3195, and hardware at $645. The "Sierra," on December 18, had machinery valued at $5063 for Australia and $3110 for New Zealand; hardware at $243 for Australia and New Zealand, and $437 for the Samoan Islands. She had sewing machines valued at $491 for Australia and $65 for New Zealand. On the same date the "Falls of Clyde," for Milo, had machinery valued at $10,030 and sewing machines valued at $875. On December 20 the "Amasis" had bridge material for Central America valued at $5200. On the same date the "Acapulco" had machinery valued at $751 for the same destination. On December 23 the "Defender" had hardware valued at $1095 for Honolulu, Hawaiian Islands.

To the Orient there were large shipments. The "Doric," December 11, had wire rope valued at $667 to Japan, hardware $190 to Japan and $77 to China, electric machinery valued at $600 to Japan, a printing press, $6000, for Japan, machinery $804 for Japan and $940 for China; type, $1316, for Manila; agricultural implements, $1139 to China, and bicycles valued at $18,468 for Japan. The "Nippon Maru," December 19, had bicycles valued at $2807 for Japan, hardware $395 for Japan, machinery valued at $1205 for Japan, watch materials, &c., $9300 for Japan, firearms $810 for Japan, typewriter $100 for Japan. J. O. L.

## OBITUARY.

FRANK O. GILSON, a partner in the Gardner Foundry Company, Gardner, Mass., died suddenly on December 17, aged 43 years. He was a native of Amherst, N. H.

HIRAM T. PLUMMER of the firm of C. M. & H. T. Plummer, iron and steel merchants of Portland, Maine, died on December 26, at Tucson, Ariz., where he had gone for his health. Mr. Plummer, who was 62 years of age, and his brother succeeded their father in the iron business, the firm having been in existence in Portland for more than half a century.

EBEN HOWELL, SR., secretary of the Illinois State Mining Board and prominent in mining circles throughout the country, died December 27, at his home in Springfield, Ill., aged 53 years.

CHARLES W. SCHLUCHTNER, a partner in the firm of F. W. Wurster & Co. of Brooklyn, N. Y., manufacturers of axles, &c., died on December 27, at his home in Brooklyn, aged 47 years. He was born in Brooklyn, and was employed in his father's hardware store until 1878, when he entered the employ of F. W. Wurster as salesman, subsequently becoming a member of the firm.

JAMES R. MCCORTNEY, formerly president of the Bellaire Steel Company, and a well-known iron manufacturer of Wheeling and the Ohio Valley, died December 27 in Washington, D. C., aged 65 years. He was born in Wheeling, W. Va., and early in life became connected with the Center Wheeling Foundry Company. Subsequently he joined the Bellaire Steel Company, of which he became the president, retiring from business three years ago.

**Oil Well Supply Company.**—The Oil Well Supply Company of Pittsburgh have issued $2,000,000 of 5 per cent. bonds to cover improvements and extensions of operations, planned and recently completed. At their Pittsburgh Works the company are just completing a new plant for the manufacture of drilling equipment, including one building, 106 x 264 feet, and a blacksmith shop, 40 x 200 feet. At Oil City a modern new plant is about completed, which displaces two plants that are being abandoned there. The company bought 45 acres for this plant, part of which is used for homes for the workmen. The investment there is about $800,000. The company have extensive works at Bradford, Pa., and at Oswego, N. Y., a large new boiler plant, covering 4 acres, is about completed. The bond issue has been sold to the Union Trust Company. The bonds are payable at the rate of $100,000 a year for the next 20 years. The capital stock of the company is $1,500,000, and the surplus is about $2,000,000. The drilling of wells for oil and gas is not confined, as it formerly was, to a few States in this section of the country, but is now being extensively carried on in Kentucky, Texas, Colorado, Kansas, Indian Territory, Wyoming, California and Alaska, and in many foreign countries, including Mexico, Japan, East Indies, India, Russia and Roumania. The Oil Well Supply Company have a large business in these various States of the Union and in foreign countries.

# HARDWARE.

THE business of the country in Hardware and kindred lines doubtless far exceeded in 1902 that of any previous year. It is equally certain that the unfilled orders upon the books of both dealers and manufacturers even now are as much larger than usual as the business done, and the feeling of gratification over a good year's trade is tempered by the thought of the still greater business that might have been done had the goods been procurable.

Hardware jobbers have complained, and not without reason, of their inability to get goods with which to supply their customers. They feel that they lose not only the profit upon the sales, but prestige as well, for a long back order list and delays in shipment create dissatisfaction and cause orders to be placed elsewhere. Promptness in filling orders is one of the most potent arguments a jobber can give for favoring him with trade, and to ship promptly he must have full stocks. To be out of goods is a misfortune, and a long continued shortage in any line seems to him a crime. That he has received twice the usual amount of goods weighs but little with him if he cannot fill the orders in hand, and in his letters to the manufacturers he is apt to ignore special favors rendered him and sometimes demands his goods with an asperity born of the fear that others are favored at his expense. Particularly is this the case if he has orders entered at prices lower than the present market and gains the idea that the manufacturer is devoting his energies to filling more recent orders taken at higher prices. Then, too, the fact that the goods were well bought and yield a good profit adds to his anxiety to get them.

The jobber's troubles in this regard are, however, slight compared to those of the manufacturer who is three months or six months behind his orders. Every mail brings letters from his customers which tell of alienated favor—threats to drop his line, accusations of broken faith, letters sometimes discourteous in their tone and insolent to a degree which would be unbearable if there were any way of avoiding it. His excuses are scorned and promises flouted. It is goods that are wanted and nothing but goods will answer. The manufacturer may tell of his efforts to satisfy, of his factory running overtime and to its full capacity; he may point to the increased shipments over previous years, but nothing but goods will answer, and if he is unable to furnish them in quantity and time desired he must face the consequences. Every dealer who writes an acrimonious letter to a factory thus worded may be morally certain that the same mail brings similar letters from other customers and can judge somewhat of the manufacturer's discomfort.

Twelve years ago there was a great cry of overproduction. To-day there is in many lines twice or thrice the productive capacity, and still the demand greatly exceeds the supply, with dealers' shelves empty and consumers clamoring for the goods. It is probable that any shock or panic that would stop the consumption suddenly would just as suddenly stop the dealers' cry for goods and cause cancellations of orders at the factories, but the warerooms of both dealers and makers would be bare of goods in most of the important lines and the loss from depreciated values of stock would be slight. While there are few indications of an early slackening of the pace, many an overworked and hard pressed manufacturer would be willing to see the demand for goods slacken that he might have an opportunity to get back upon a comfortable working basis when he could send his men out on the road without receiving complaints from every customer. A great volume of business which overtaxes the capacity of mills and factories, congests the railroads and obliges merchants to make many explanations to their customers for tardy supply of their wants is certainly an impressive exhibition of prosperity, and the resulting inconvenience evidently calls for patience and good nature, consideration for others and the cultivation of the courtesies and amenities which do much to smooth the rough places in business life. Assuredly the advantages connected with great activity in trade should enable both manufacturers and merchants to meet philosophically and even cheerfully the attendant disadvantages and annoyances.

## Condition of Trade.

There has been since the opening of the new year scarcely time for the market to assume any especially new features or to become particularly active. The attention which is being given to the closing of the accounts of the past year and getting things in shape for the season which is soon to open has engrossed the principal energies of both merchants and manufacturers. Meanwhile, there have been indications of a resumption of activity in the purchase of goods, and orders are beginning to come to the manufacturers in such a way as to show a good feeling and an excellent prospect for business. The advances made in Wire Nails and Wire have had an excellent effect on the market, and while not unexpected have contributed to the prevailing confident tone. Several other advances in minor lines have tended in the same direction and revisions of prices generally, even where there have been no general advances, have resulted in the withdrawal of slight concessions and a moderate toning up of values. The lines in which there is anything of weakness are comparatively few and the general condition of the market is eminently satisfactory.

### Chicago.

*(By Telegraph.)*

The feature of the week has been the readjustment in prices of various specialties, due to the advances made by manufacturers, most of which changes went into effect on the first of the year. As a rule the advances range from 5 to 10 per cent., and other manufacturers are expected to be heard from. Thus far the principal changes noted are as follows. On Planes and Rules an advance of 5 per cent., on Plumbs and Levels a rise of 10 per cent., on Chisels, Drawing Knives and Wooden Planes the advance ranges from 5 to 10 per cent. Loaded Shells have gone up 5 per cent., and Common Powder 10 cents per keg. Japanned Goods, Pulleys, Hooks, &c., have sustained an advance of 10 per cent., but some manufacturers who had previously been below the general market have advanced 20 per cent., bringing all now on the same level. An advance, too, of 10 per cent. has been noted by manufacturers of Casters, of Washing Machines and of Porcelain Lined Kettles. On Sad Irons certain makers have made an advance of 8 cents per set, while Handles for Axes and similar goods are 5 per cent. higher. The advance on Nails and Wire has been 10 cents in the Chicago district and 5 cents in the Pittsburgh field. It is reported that the options given by the various manufacturers of Edge Tools upon their plants have been extended to March 1. Among the jobbing trade there has been a little freer movement in both general and special lines, it being notable that some early shipments of Steel Goods have been made to the South. The general distribution of such goods for spring delivery, however, has not begun as yet. In heavy lines the advance in freight rates, which went into effect on the first of the year, has slightly ef-

fected an early movement of such goods, but it is remarkable how the advance in prices has in a measure offset this tendency and stimulated the purchase of goods which had been too long deferred by skeptical consumers. Some local jobbers are still in the throes of the annual inventory troubles, but without an exception previous reports have been verified, in respect to the volume of business, with the probability that profits will also show the anticipated increase previously noted. It is reported that the recent conference of manufacturers of Builders' Hardware in the East was not productive of changes as far as prices are concerned, although the general sentiment favored an advance.

### St. Louis.

*(By Telegraph.)*

Now that the holiday season is over, stock taking is completed and salesmen have resumed their road work, jobbers report that sales are keeping well up to the recent high mark. The annual review of general business in banking and financial circles shows a highly prosperous condition in this center. The comparison of bank clearings for 1901 and 1902 shows an enormous increase, and the record of dividend payments from the various local institutions bears out in a striking way the highly profitable condition of affairs.

## NOTES ON PRICES.

**Wire Nails.**—Manufacturers have advanced the price of Wire and Wire products, including Wire Nails, $1 per ton, which is equivalent to 5 cents per keg on Nails. While an advance after the first of the year was not entirely unexpected, the largest interest have followed their policy of keeping prices of their product within reasonable limits. Quotations are as follows:

| | |
|---|---|
| Jobbers, carload lots | $1.90 |
| Retailers, carload lots | 1.95 |
| Retailers, less than carload lots | 2.05 |

*New York.*—In addition to the 5 cents per 100 advance in the price of Wire Nails, the increase in freight rates since the first of the year adds something over 1½ cents to the cost per keg, delivered at this point. Jobbers generally have notified their trade of a 5-cent advance over recent prices. On this basis quotations are as follows: Single carloads, $2.10; small lots from store, $2.15.

*Chicago, by Telegraph.*—While there has naturally been a less heavy movement during the week following the advance in freight rates, there has been a fair volume of orders booked by manufacturers at the advanced prices, which went into effect on January 1. The jobbing trade, too, has been very satisfactory and prices have been well sustained at the advance. Official quotations are now $2.10 in carload lots, mill shipment, and $2.20 in less than carload lots, f.o.b. Chicago.

*St. Louis, by Telegraph.*—Activity continues in the demand for Wire Nails and the jobbing trade look forward to a large spring call. Prices rule steady in small lots from stock and $2.15 is asked.

*Pittsburgh.*—The larger interest report a heavy increase in demand for Wire Nails and more tonnage is being booked than for some time. Specifications on contracts are coming in very freely. There is still some difficulty in getting prompt deliveries, owing to congested condition of the railroads. The tone of the market is very firm, there being practically an entire absence of any concessions in prices. We quote Wire Nails as follows: $1.90 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged, and for tinning Nails $1.50 per keg extra.

**Cut Nails.**—The manufacturers of Cut Nails held a meeting in November of last year, at which time they announced that their next meeting would be held about the middle of January. The market is firm and manufacturers have not all caught up with their orders. Quotations are as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

*New York.*—While the demand is light owing to the season, the market at this point is practically bare of some sizes of Cut Nails. Quotations for carloads and less than carloads are as follows:

| | |
|---|---|
| Carloads on dock | $2.18 |
| Less than carloads on dock | 2.23 |
| Small lots from store | 2.30 |

*Chicago, by Telegraph.*—There has been a fair movement in Cut Nails, with the tone of the market a little firmer, but sales have continued to be made on the basis of $2.10 to $2.15 in carload lots, and $2.20 to $2.25 in less than carload lots for Steel, Chicago. Iron Nails are selling in a jobbing way at $2.30 from store, Chicago

*St. Louis, by Telegraph.*—Demand continues of a fair order for Cut Nails, and jobbers quote $2.30 in small lots from store.

*Pittsburgh.*—We note an improved demand for Cut Nails, and the mills are booking more orders than for some time. Shipments are still delayed, and there will probably be more or less trouble from this source during the winter months. Steel continues scarce. The tone of the market is very firm, prices being rigidly held. Iron Cut Nails continue to bring the usual advance over Steel. We quote Steel Cut Nails as follows: $2.05, base, in carloads and $2.10 in less than carloads, plus freight in Tube Rate Book to point of destination, terms 60 days, less 2 per cent. off in 10 days.

**Barb Wire.**—The advance in the price of Wire products increases the price of Barb Wire at mill 5 cents per 100 pounds. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | Painted. | Galv. |
|---|---|---|
| Jobbers, carload lots | $2.20 | $2.50 |
| Retailers, carload lots | 2.25 | 2.55 |
| Retailers, less than carload lots | 2.35 | 2.65 |

*Chicago, by Telegraph.*—After the heavy movement prior to the opening of the year, the past week has been relatively quiet, but even so there has been a fair volume of business, the market being strong in tone with the full advance of 10 cents per 100 pounds now in effect. Official quotations for Galvanized are $2.70 in carload lots and $2.80 in less than carload lots, Chicago. There has also been a fair demand for Staples at the advance, sales being made on the basis of $2.15 in carload lots and $2.25 in less than carload lots, Chicago.

*St. Louis, by Telegraph.*—The demand for Barb Wire shows steady improvement, and conditions generally are encouraging for a large spring movement. Jobbers quote in small lots from store Painted at $2.45 and Galvanized at $2.75.

*Pittsburgh.*—Tonnage in Barb Wire is improving, and the mills are receiving more orders and making larger shipments than for some time. Specifications on old contracts are coming in very freely. The tone of the market is firm at the advanced prices, and we quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days: Painted, $2.20; Galvanized, $2.50, in carload lots to jobbers; Painted, $2.25; Galvanized, $2.55, in carloads to retailers; Painted, $2.35; Galvanized, $2.65, in small lots to retailers.

**Plain Wire.**—In conformity with the advance in the prices of Wire Nails and Barb Wire, Plain Wire has also been increased 5 cents per 100 pounds. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| Jobbers, carloads | $1.80 |
| Retailers, carloads | 1.85 |
| Less than carloads | 1.95 |

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

| 6 to 9 | 10 | 11 | 12&12½ | 13 | 14 | 15 | 16 | 17 | 18 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Base | $0.05 | .10 | .15 | .25 | .35 | .45 | .55 | .70 | .85 | Plain. |
| $0.30 | .35 | .40 | .45 | .55 | .65 | 1.05 | 1.15 | 1.70 | 1.85 | Galv. |

*Chicago, by Telegraph.*—While business has not been so heavy as for several weeks past, there has been a

fair movement, especially in the jobbing trade, the advance of 10 cents being fully maintained as follows: Nos. 6 to 9 in carload lots are held at $2 on track and $2.10 from store, Galvanized bringing 30 cents extra for Nos. 4 to 14 spot.

*St. Louis, by Telegraph.*—The jobbing trade are feeling some improvement in the demand for Plain Wire, and No. 9 is quoted at $2.05 and Galvanized at $2.35, in small lots.

*Pittsburgh.*—The tone of the market, in view of the advance just announced, is firm and tonnage is increasing right along. The mills have booked large orders for shipment in first three months of this year. Prices are firm and we quote: Plain Wire, $1.80, base, for Nos. 6 to 9, in carloads to jobbers, $1.85 in carloads to retailers and $1.95 in small lots to retailers; Galvanized 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

**Planes.**—An advance of 5 per cent. in the base discounts has been made by the manufacturers of Wood Planes, the base discounts now being as follows: First quality Planes, 40 per cent.; second quality Planes, 50 per cent.; fancy and miscellaneous Planes, 33 1-3 per cent.

**Plumbs and Levels.**—The revised lists on Plumbs and Levels announced by the manufacturers are now in force, and inequalities which had been developed in the long term of years in which the lists have been in use are thus corrected.

**Tarred Roofing and Building Paper.**—The condition of unprecedented demand for these products still continues, although tempered to a slight degree by the early winter. The market prices for Roofing Felt, Rosin Sized Sheathing, Deadening Felt, &c., are on the average higher than ever before, but this condition is not entirely due to the consolidation of manufacturers which was consummated early in 1902. There is no doubt that the scarcity and consequent high price of paper stock and coal had much to do with this situation. The so-called trust or combination seems to have profited by past experiences, and has shown a reluctance to advance prices as promptly as in the past, possibly realizing that sudden abnormal advances might be an incentive to new interests to enter the field. If the present apparent policy of the concerns dominating the situation is continued no further increase in price, it is believed, will occur, but a reduction can hardly be expected before April or May, 1903. The consolidation of the tarred products interests was effected last February. It is rumored that at least one of the larger outside Western manufacturers in Ohio River territory has been induced to abandon its competition in the Eastern field entirely. Prices at present are high, Tarred Roofing Felt, single ply, being quoted at $31.50 to $34.50 per ton, for carloads and less than carloads respectively, this being practically the base for manufacturing points. For the remoter sections freight must be added in proportion to the distance from original sources of supply. Other quotations are: Tarred Roofing, two-ply, 55 to 60 cents per roll; three-ply, 80 to 85 cents per roll for C. L. and L. C. L., respectively. Deadening Felts, $45 per ton, and Rosin Sized Sheathing, $31 per ton.

**Binder Twine.**—As yet nothing definite has been done in regard to announcing prices for Binder Twine. The International Harvester Company will dominate the market to a considerable extent, and manufacturers not included are waiting for some announcement of prices and the policy of the combined factories. Some makers in reply to inquiries for quotations offer to book orders, and to bill at lowest price ruling at date of shipment. Prospective buyers do not appear to be anxious to place orders on these terms. Manufacturers are not seeking business, and are disposed to pursue a conservative course, waiting to see what will develop in prices for Sisal Hemp. The International Harvester Company may possibly play a prominent part in the raw material market. Travers Brothers Company of New York have taken a contract to furnish the McCormick division of the International Harvester Company 5,000,000 pounds of Jute Binder Twine. This contract, we are advised, will absorb the manufacturers' output in this line for the season. The company regard this sale as significant as indicating the approval of their Jute Twine by such an important concern as the International Harvester Company. This contract will not interfere with Travers Brothers Company's regular trade in the Twine, Rope and Hammock business, as they operate three mills, one each at Easton, Pa.; Roanoke, Va., and Fifty-second street, New York.

**Cordage.**—Demand is very light for Rope, owing to the season, and to the uncertainty of future prices for raw material. Manila Rope is quoted, on the basis of 7-16 inch and larger, at 11 to 11½ cents per pound. Sisal Rope, on the same basis, is quoted at 7¾ to 9½ cents, the latter quotations representing quality.

**Paints and Colors.**—*Leads.*—Manufacturers of White Lead in Oil did a very satisfactory business in 1902 and look forward to a large distribution of their product during the present year. It is not anticipated at present that there will be any change in ruling prices in the near future. Quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—*Linseed Oil.*—There is considerable Oil being sold in small lots. Crushers are willing to accept orders for future shipment at ruling prices, but are not making concessions to induce business along this line. The future of the Seed market is as much of a problem as ever. The view is expressed by those in the trade that Oil may hold at present or a shade lower prices for spring trade. Quotations, according to quantity, are as follows: City Raw, 46 to 47 cents; State and Western, 45 to 46 cents per gallon.

**Spirits Turpentine.**—The Turpentine market continues to advance, at this point, on fair buying. Quotations, according to quantity, are as follows: Southerns, 56 to 56½ cents; machine made barrels, 56½ to 57 cents per gallon.

# Communications

## Misrepresentation by Catalogue Houses.

*From a Western Merchant:* The greatest complaint we have to register is against catalogue houses, who make some of our people believe that they can buy from them as cheaply as we buy from our jobbers, whereas, in many instances we would cheerfully meet the price. This pernicious tendency to misrepresent facts in advertising goods, as practiced by department stores and catalogue houses, gives the retailer decidedly the worst of it. These houses have a large field in which to catch their suckers, while the legitimate retailer must face his customers all of the time and sell his goods accordingly.

## Hindrances to Trade.

*From a Merchant in Illinois:* There has prevailed a confidence in the stability of prices, owing to a feeling that our large corporations were in control of the markets and of the supply. Certain hindrances there have been to this trade, among which we note the direct solicitation of the architect and contractor by the manufacturer of Builders' Hardware. And even where it chanced that a portion of this merchandise passed through the retailer, margins have been so very small there is little satisfaction in handling the business. House Furnishing Goods, Cutlery and other kindred lines controlled in years past by the Hardwareman have now passed over to the dry goods house, the department and racket stores, thus narrowing the field of the Hardware trade. Stocks are generally complete, though we should not say "heavy," the retailer having come to expect the manufacturer and jobber to carry the large stocks.

## Devices for Holding Samples.

A Hardware house in the West who are adding new fixtures to their store are desirous of ascertaining the names of manufacturers of Brackets and kindred ar-

ticles for holding Hammers, Drawing Knives and similar Tools in a side wall case. We invite suggestions from Hardware merchants in regard to the sources from which these articles may be obtained.

# THE MANAGEMENT OF TRAVELING SALESMEN.

### Chapter I. The Salesman's Position.

THE Hardware business of to-day cannot be done without traveling salesmen. Personal solicitation has become so universal that less persuasive methods of inducing trade are not effective. Efforts are made to cultivate a mail order business, and inducements in the way of prompt shipments, special attention given to "hurry" orders, &c., are offered, but usually the results are but slight and in many instances the jobber's mail order department accomplishes less than one of his best salesmen. There was a time when the mail trade showed a marked increase when the salesmen were away for their vacation or in the house for the annual "round up," but each year the increase is less perceptible, showing the importance the dealer attaches to the salesman's visits, and that it is the man on the spot who gets the orders.

HIS COST.

To keep on the road the several thousands of traveling men who canvass the trade for the jobbers costs not far from 40 per cent. of the gross profit on the business thus attained. This is the cost for salesmen's salaries and expenses alone and does not include any of the other expenses the jobber charges to sales. In dull times or in poor or new or distant routes the cost is greater than this, and it is safe to say that the ordinary jobber has in his field at all times routes where the salesmen's service costs more than the figure named.

The manufacturer pays a small percentage. As a rule his salesman receives more for his services than the jobbers' representative, but he covers a wider field, often taking large contracts to extend over six months or a year, and his sales are much larger. Still the selling expense is usually high enough to be a matter of some anxiety to him, and if he could he would do away with his traveling men.

LITTLE REDUCTION IN COSTS POSSIBLE.

One of the first things the ordinary trust does is to cut down the traveling force—and often the next thing is to get into the field a greater number of men than before. The saving in selling expenses is one of the main arguments made in favor of forming such consolidations, and the effect is first felt on the road, but in the end it costs just about as much for personal solicitation as before for each dollar of business gained.

EFFORTS TO INCREASE RESULTS.

With the increase in competition and the reform in business methods to conform to the changed conditions has come the adoption of new and improved systems for caring for the road business. As the importance of salesmen as a class has grown and their numbers have multiplied, the personal importance and the independence of the individual salesman have dwindled. It is not enough for the employer to know that he gets a paying trade from the salesmen's efforts. He has a growing anxiety concerning the trade he does not get, and wants to know the detail of the trade solicitation, as he knows the ins and outs of everything that goes on at home. There are still salesmen who can speak with confidence of "my trade," but they are relatively fewer than of yore. The days when a salesman was practically unrestricted in his movements, visited whom he liked when he chose and considered his orders all the explanation or report necessary, are over. He has fallen under the sway of the time clock system and is working in harness just as regularly as the man in the house under the eye of the managing force. The card system of records of his movements, route maps diligently consulted, profits figured in all business and less leeway in the matter of prices are among the limitations that affect him to-day. If he has less of freedom than formerly he has a closer touch with his house and a more cordial support coming from a better knowledge of things afield.

ADOPTION OF NEW METHODS UNIVERSAL.

Naturally, the jobbers with their larger number of salesmen were the first to tame their Pegasuses and break them to routine. Manufacturers with a number of travelers have followed, and now the large concerns who are handling their road force on the same basis they did ten years ago are few. In most cases they are managed by old traveling men promoted from the road, who are too firmly fixed in former methods to adopt new ones and with no appreciation of the importance of system in the management of men.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

Mathes Hardware Company, San Diego, Cal., who closed out their stock last March, on account of the undesirable location of the store, will open up again under the same style in a few weeks with a larger and more complete stock on Fifth street, the principal business thoroughfare of the city. They request copies of catalogues, price-lists, &c.

The firm of Allison & Searle, Margaretville, N. Y., dissolved on the 1st inst., and B. L. Searle will continue the Hardware business at the old stand under his own name. A. Allison, who will handle Wagons and Sleighs in connection with other business, will be glad to receive catalogues and quotations relating thereto.

Fitzhugh Lee & Co. have commenced business at Winder, Ga., as brokers and manufacturers' agents. They refer to the wonderful growth of this town during the past five years and the excellent prospect for its future development. The new firm will be pleased to receive catalogues and other trade literature pertaining to the Hardware business.

The Hardware stock of Frank B. Ingold, Hickory, N. C., was destroyed by fire on the 23d ult. The loss was $4500; insurance $3000. The warehouse, with contents valued at $1500, was saved. Mr. Ingold will resume business within 30 days, and requests copies of catalogues and price-lists relating to Hardware, Stoves, &c.

J. P. Gartner, Chillicothe, Ohio, has been succeeded by the Chillicothe Hardware Company, who have just been incorporated. The new company will handle Hardware, Agricultural Implements, Wagons, Buggies, Seeds and Fertilizers, and will appreciate copies of catalogues and quotations from manufacturers in these lines. The officers of the new company are D. H. Roche, president; S. F. Secrest, vice-president and general manager; F. C. Secrest, secretary; D. H. Roche, Jr., treasurer.

## A. MACFARLANE & CO.

A. MACFARLANE & CO. is the style of a new firm which has lately begun business as metal brokers and Hardware manufacturers' agents, with offices in Coristine Building, Montreal, Canada. The firm comprises Archie Macfarlane, who for the past 15 years has been associated with Caverhill, Learmont & Co., and James Arnold, late manager of Henry Boker & Co.'s Canadian branch. The firm will handle American and foreign goods, which they will sell to the wholesale trade exclusively.

J. L. SPERRY of the Acme Mfg. Company, Plantsville, Conn., is about to leave on an extensive trip to the Pacific Coast, visiting the principal cities on the way. Mr. Sperry will carry with him a full line of Hurwood Tools.

# SYNDICATE BUYING.

THE fact that negotiations are progressing between the National Hardware Association and the various syndicate buyers in this city, together with the letters published in our last issue, have commanded very general attention throughout the trade from both manufacturers and merchants. The interest which the subject possesses is indicated also in the letters which are given below, and the expressions of a prominent firm of syndicate buyers:

## OLIVER BROS. ON SYNDICATE BUYING.

A representative of *The Iron Age* called upon Oliver Bros. of this city, who are widely known as prominent and successful syndicate buyers, to afford them an opportunity to state their position in regard to syndicate buying, especially with reference to the comments on the system which were published in the last issue of *The Iron Age*. In reply to a general inquiry as to the manner in which they regarded the reflections cast upon syndicate buying by some manufacturers Oliver Bros. said:

We consider syndicate buying as legitimate as manufacturing, jobbing or any other branch of the trade if honestly conducted on business principles. That it is so regarded is evidenced by the fact that so many of the most reputable and the larger class of jobbers and manufacturers make use of syndicate buying, the one class for the purchase of their goods and the other for the economical and efficient distribution of them. We have at times heard reflections cast upon the methods of individual syndicate buyers, who perhaps on their part have listened to reflections upon our methods. We assume, however, full responsibility for our own business policy and practice. We are conscious of having pursued an honorable course from the outset and are ready to defend vigorously our position and resent any reflection upon our methods or practice. All branches of the trade are subject to abuses and it would be strange if there were not some in connection with syndicate buying. In fact the organization of manufacturers' associations, jobbers' associations and retailers' associations is largely in recognition of this fact, and for the purpose of correcting existing abuses if possible. We claim for our business the same credit or discredit for our actions that merchants in any other branch of trade would claim, and no more. If it is a fact that the system has been abused then criticism of its abuses should be directed toward the individuals responsible for the same. Is it to be supposed that the large number of very reputable jobbers we represent would so closely associate themselves with us if they did not regard our system as legitimate and our firm as honorable in its dealings?

*What percentage of manufacturers and jobbers do you estimate employ the syndicate buying system?*

We judge about 75 per cent. of both jobbers and manufacturers, notwithstanding the fact that most of the expressions in your last issue are in opposition to the system. There is, however, much force in the statement made in the remarks of *The Iron Age* in opening the subject:

Other manufacturers who are glad to avail themselves of the services of the syndicate buyers in marketing their goods are naturally more reserved in discussing the subject, as are the jobbers who directly support the system."

The unfortunate feature of this question is the one which you mention—namely, the care with which the large majority of manufacturers and jobbers profiting by the system avoid open discussion of it, partly for the reason, as they have frankly stated, that it is a good thing for them, which they are not willing to advertise to their competitors. Their opinion of the system, however, is indicated by their use of it rather than by expressions which are made publicly, and sometimes for effect. We could mention a good many manufacturers who talk against the system on theoretical grounds but still make use of it as part of the existing machinery for the distribution of goods.

While the syndicate buying system can be made profitable to all jobbers without exception, there are a limited number of manufacturers who, because of the nature of their business or the lines they produce, do not find any benefit in catering to the syndicate buyers, and it would seem as though you had singled out these particular ones for the expressions of opinion published in your issue of the 1st inst. The evident ignorance or prejudice, however, on the part of some of your correspondents in reference to this subject, along with the fact that they do not dignify their letters with the publication of their names, disqualifies them, to our minds, from a reasonable discussion of the subject. A number of the points made are certainly unjust and without warrant.

*What do you think of the effort of the National Hardware Association to reach an agreement with syndicate buyers in regard to the houses represented?*

Without doubt the syndicate buyers have come to stay, which fact is fully realized by not only the majority of Hardware manufacturers, but also jobbers, and it bespeaks intelligence and wisdom on the part of the National Hardware Association in authorizing their secretary to negotiate with the syndicate buyers with a view to rearranging their list of clients; in fact the jobbers have much to gain and absolutely nothing to lose by the movement, the result of which will deprive a very large number, not only of retailers but the smaller class of jobbers, from obtaining the benefit of the special prices which they have heretofore enjoyed through the syndicate buyers. The National Hardware Association have given no formal indorsement to the system, but have, through the skillful efforts of their secretary-treasurer, secured a decided benefit to the members of the association and probably some of the manufacturers in persuading the syndicate buyers to sever their connections with a large number of the smaller houses. Of course the National Hardware Association would not have taken such action in the matter if it were not for the fact that a large percentage of their members were represented by the syndicate buyers and realizing the strength of the syndicate buyers' position.

Notwithstanding the fact that the syndicate buyers felt strong enough to act on their own independent judgment and to pursue their course as heretofore, they realized the justice of the jobbers' claims, and at a great sacrifice in their incomes for the present have decided upon the course which, while strengthening their position throughout the trade generally, will unquestionably result to the jobbers' benefit.

*Do you publish lists of the houses you represent?*

No. We are under obligations not to do so, but have never refused to show the list to manufacturers calling at our office when knowing that their purpose was not curiosity alone, but with the idea of working together to our mutual advantage.

*If the obligations you speak of could be overcome would your disposition or business policy prompt the publication of the list?*

Yes, we think it would help our standing. We know that, prior to our agreement with Mr. Fernley as secretary of the National Hardware Association, we would probably be criticised on account of some of our connections, but all points considered, we believe the publication of the list would help us. On occasions when we have shown the list to prominent manufacturers they have expressed surprise at the very few small in comparison with the number of large jobbers we represent, as they evidently had the impression that we represented a smaller class of houses than our list contained, perhaps because of the fact that we at times receive orders from our clients among the large jobbers for shipment to their retail customers and for lines which for one reason or another are charged to our account so that our client (the jobber) has not been identified with the order. Of late, however, we have been putting the jobbers' names on the orders to remove the impression on the part of the manufacturers that the retailers to whom the goods were to be shipped were our clients.

*Then the invoices are generally made to your clients and not to you, as some of the correspondents intimate?*

We estimate that about 90 per cent. of our total purchases, which aggregate several million dollars in value per annum, are charged direct to our principals. The other 10 per cent. is charged to our account. Our policy has always been to induce manufacturers to make charges direct, and it is almost invariably by agreement with the manufacturer or to meet certain conditions imposed upon us by him that we make purchases in our own name. It is a very rare case where we would refuse to allow the manufacturers to know the name of our clients ordering the goods, and in such cases, which we repeat are very rare, there is a good reason for it and it is not of our own prompting.

*One of our correspondents asks what is to prevent the syndicate buyer from opening an office in an adjoining room and under another name representing the houses, which you state are large in number, with whom the syndicate buyers are canceling contracts?*

Their own common sense and business judgment and good faith. The suggestion is too absurd to dignify with a detailed reply.

*What have you to say in reference to the charge that syndicate buyers are slow in payments?*

Simply that Oliver Brothers have promptly met their obligations at all times since they have been in business, and we think without a single exception have always discounted bills bearing a cash discount of 6 per cent. per annum or more. Whatever may have been the case in the past, we believe the other syndicate buyers also are prompt and businesslike in their payments and do not deserve the imputation your correspondents cast upon them.

*Are the syndicate buyers instrumental in starting new lines of manufacture?*

We know of but one of the syndicate buyers who has pursued such a course and that in a very limited way. Such a course, however, even if pursued, instead of being unreasonable or unbusinesslike, would have been only following the example of many large jobbers.

*What about syndicate buyers threatening manufacturers with loss of trade if they do not name them special prices?*

I think all of the syndicate buyers are too shrewd to make any such threats. They, of course, are seeking to serve the interests of their clients and buy goods from the manufacturers whose products and prices are most satisfactory. Any criticism made against them in this regard can be made quite as justly against every jobbing house in the country. With the pleasant relations we have with manufacturers in practically every important line, our regret is that we are unable—notwithstanding the great volume of our business—to give them all as many orders as they want. They apparently find syndicate buyers an economical and satisfactory channel for disposing of a large part of their product.

## LETTERS FROM MANUFACTURERS.

**From Manufacturers in Ohio:**

Syndicate buying is the nearest approach to the pawnbroker auction business that commercialism has yet been subjected to.

Manufacturers whose pride and love is quality, either in the way of special or factory brands, cannot with satisfaction to themselves be in sympathy with such a movement or even countenance it. There is truth in the old saying: "Goods well bought are half sold." This does not simply imply that price alone rules the purchase, for there are several essential meanings to be construed from it:

First. It is the quality.
Second. It may be the quantity.
Third. The price.

We hold that the last is a secondary consideration, for quality should rule the price, and this with a rigid avoidance of overbuying together with an honest price must be controlled by quality and competition.

It is a well-known fact that goods bought through the agency of syndicate buyers of special brands of some kinds are woefully lacking in quality, consequent to the effort made in the offering of a low price; cheap goods are always short lived and market disturbers.

Manufacturers should be permitted to display and explain the merits of their goods from where they are sold, and the buyer and salesman should be placed in position to talk intelligently about them.

Syndicate buying does not permit this. The manufacturer is informed by the syndicate that they will take his prices, and that the buying is done 1000 or 2000 miles away, in consequence of which headquarters may be considered simply in the light of an Information Bureau, while all the knowledge and merits of the goods are locked up in the head of the buyer at long distance range.

At the syndicate buying office the manufacturer is confronted with a sign reading, "Consulting hours from 10 to 12 a.m. and 2 to 4 p.m." Consultation means the all important question, "Price." He is then informed that the matter will be taken up with the different houses by mail, and possibly in 30 days he will receive an order for a few dozen or gross, as the case may be, which statement is followed 30 days later by another such order with this significant expression added, "If at ——," meaning a cut from 5 to 20 per cent.

Some syndicate buyers have a few real jobbing houses on their list, supplemented by a large number of retail accounts, who frequently obtain by unfair business methods jobbing prices. These quotations are handed over to the jobber, who immediately calls upon the manufacturer for an explanation, and very likely demands an extra rebate from the latter by virtue of the information he is in possession of.

There are many other reasons why syndicate buying is a detriment, not alone to the manufacturer, but to the jobber and retailer as well, frequently causing said manufacturer to seek the retail trade and ignore the jobber and syndicate buyer.

Syndicate buying from any point of view is most detrimental, and should not under any circumstance be given recognition by the manufacturer, and we believe it the duty of every manufacturer to accept the kindly invitation of the editor of *The Iron Age* to send in their views upon such an important subject.

**From Manufacturers in Michigan:**

In framing an opinion of syndicate buyers one naturally looks back to the motive that leads to their creation. In the main it is to obtain a price usually given only to large buyers. A step further back brings the question of why manufacturers give lower prices for invitation of the editor of *The Iron Age* to send in his cient, as it is too old and familiar to discuss.

The clients of a syndicate buyer are not able generally to offer singly any of the causes that induce the manufacturer to grant concessions, because they don't effect for him any of the savings accomplished by the sale of goods in large quantities, nor does the syndicate buyer supply the deficiencies. On the other hand, the syndicate buyer is a disturber of trade relations as they exist between the manufacturer and the jobber.

Inasmuch as the jobbers are largely in the majority their interests are the ones the manufacturer must consider if he is to be fair and consistent in his dealings. We usually settle prices to a syndicate buyer by agreeing to sell his clients through him at such prices as their quantity purchases would entitle them to or at such prices as their respective positions in trade may command. We have taken this position independently of any persuasion on the part of the jobbers, and, in fact, have always considered the subject from the same light.

**From Manufacturers in New England:**

For more than ten years we have had but one rule to govern us in dealing with syndicate buyers. During this time we have absolutely declined to quote any syndicate buyer in the country an open price. If a syndicate buyer requests us to name a price, we always insist that we shall know the name of the party for whom the prices are wanted. If, when this information is furnished, we are willing to sell the concern in question,

we quote the syndicate buyer a price at which we will furnish our goods to this particular concern, and always take pains to state that the price will not obtain for any other dealer represented by the syndicate buyer, unless previously confirmed by us.

In other words, we have absolutely no use for a syndicate buyer, but do not object to quoting through one the same price that we would name the client direct. We have no faith, however, that the National Hardware Association can accomplish any great reform in the syndicate buying line.

## ANNUAL OPENINGS.

THE WOOSTER HARDWARE COMPANY, Wooster, Ohio, in 1901 had a "Cracker Opening," which was described in a former issue of *The Iron Age*. This proved so successful, resulting in thousands of persons visiting their establishment, that they determined to

WOOSTER HARDWARE CO'S

FIFTH

**Annual Grand Opening**

WILL BE

**Manufacturers' Sales Days**

**Thursday, Friday and Saturday, April 3, 4 and 5, 1902.**

At this time we will again place on sale the largest and most magnificent stock of Buggies, Wagons, Wind Pumps, Farm Implements, Buggy Harness, Hardware, Paints, Oils, Garden Seeds, etc., etc., to be found in any retail store in Ohio. About twenty-five factories will have their representatives here to show their wares, and if good goods and low prices count for any thing, this sale promises to be the largest we have ever experienced, and will be a benefit to buyers.

Last year we could not wait on all the people who visited our opening. This year with about 40 salesmen and clerks, we hope to take care of all who come.

The "*It*" enclosed is worth 25 cents if returned to us according to instructions on page 4. "It" will be good only on Manufacturers' Sales Days, April 3, 4 and 5.

Respectfully,

WOOSTER HARDWARE CO.

In the D. D. Miller Room, WOOSTER, OHIO.

KOCH BROTHER'S Buggies are good Buggies. See them during Manufacturers' Sales Days, April 3, 4 and 5.

The Cyclone Land Roller crushes all competition.

*Fig. 1.—First Page of Folder (Reduced).*

have another opening the following year, to be known as "Manufacturers' Sales Days." In Fig. 1 is given a reproduction of the first page of a folder, reduced, which was widely distributed and mailed to the people throughout the surrounding country. Inclosed in the folder was "It," an illustration of which is shown in Fig. 2. The device consisted of a semicircle of light brass spring wire the ends of which were connected by an elastic band.

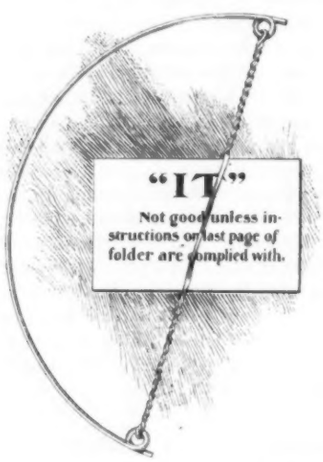



*Fig. 2.—Spring and Card (Reduced).*

The small ticket was placed between the two parts of the band, so that when the folder was opened it would fly out. On the inside of the front cover of the folder were the following verses:

**"IT"**

"*It!*" What is "*it?*" you say,
Look up your dictionary, pray;
But still you'll wonder what is "*it;*"
For its *meaning* is no benefit.

Pick up the "*it*" that flew about;
"*It*" will help you think it out.
When you learn what "*it*" will do,
Remember how we thought of you.

Bring "*it*" with you to our opening;
There we'll see you, we are hoping.
There you'll find what "*it*" will get,
The very thing you want, you bet.

**See Page 4 what to do with the "IT" enclosed.**

Fig. 3 is a reproduction, reduced, of the fourth page to which reference is made underneath the verses. It will be noticed that the instructions provide that the

**Instructions.**

The enclosed "*It*" will be good for 25c. on any purchase, large or small, made at our store during Manufacturers' Sales Days, April 3, 4, and 5, provided the following rules are complied with.

1. No "*It*" will be honored by us unless presented by the person whose name is written on envelope, and only one "*it*" can be presented by any one person.

2. Any person presenting an "*It*" must first fill out blank on inside of back cover of folder, giving one or more names of persons you know want to buy something in our line this season, and visit our buggy and implement display in the Academy of Music building, before the name will be honored.

3. Any lady or gentleman can get an "*It*" from us for the asking, but no "*Its*" will be given to children or received from them.

4. No "*Its*" will be given after April 2d, and positively will be good only if returned on April 3, 4 and 5, 1902.

WOOSTER HARDWARE COMPANY,

WOOSTER, OHIO.

In the D. D. Miller Room.

SEE THE

**Marshallville Buggies**

In our Exhibit during Manufacturers' Sales Days, April 3 4 and 5, 1902. THEY ARE SIMPLY FINE!

NONE BETTER!

BULLS' EYE and BLACK HAWK

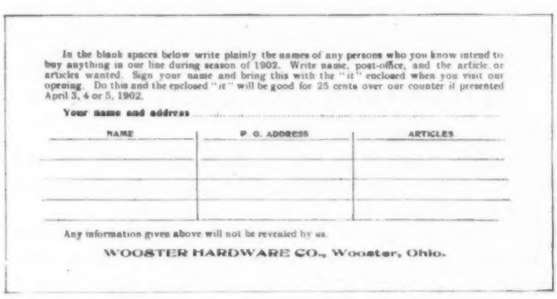
**CORN PLANTERS**

Most accurate Drop.

The acknowledged Winners for 1902.

*Fig. 3.—Reproduction of Fourth Page (Reduced).*

person presenting "It" must write his or her name on the envelope, besides filling out the blank shown in Fig. 4. This blank was printed on the inside of the back cover of the folder. The implement display at the Academy of Music had to be first visited, when the envelope with the inclosures could be presented at the company's store, when "It" would be good for 25 cents on any purchase. The object of this arrangement was, in the first place, to get people to come to the store to see the stock of merchandise, with the hope that they would


In the blank spaces below write plainly the names of any persons who you know intend to buy anything in our line during season of 1902. Write name, post-office, and the article or articles wanted. Sign your name and bring this with the "*It*" enclosed when you visit our opening. Do this and the enclosed "*It*" will be good for 25 cents over our counter if presented April 3, 4 or 5, 1902.

Your name and address .....

| NAME | P. O. ADDRESS | ARTICLES |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Any information given above will not be revealed by us.

WOOSTER HARDWARE CO., Wooster, Ohio.

*Fig. 4.—Blank to be Filled Out (Reduced).*

become the company's advertisers. The object of having the blanks filled out was to learn of prospective buyers throughout the country. The blanks as they were returned to the company properly filled out were placed on file for the use of their canvassers. By referring to the blanks they knew just where to drive to find people who wanted to buy something in the company's line. This feature was one of the strongest points in favor of the whole affair. The opening proved a great success.

## LOGAN-GREGG HARDWARE COMPANY'S DINNER.

THE seventy-second annual dinner to their employees, at the close of inventory, was given by the Logan-Gregg Hardware Company, Pittsburgh, Pa., on the evening of January 2. The "Stock Supper," as it is called, was served in a corner of the sample room, which had been fitted up for that purpose. Music was furnished by an orchestra during the meal, after which addresses were made by a number of those present. A history of the happenings during the past year was read by Earl C. Mann, head of the Cutlery Department. Geo. B. Logan, the president, spoke of the necessity of each employee doing the work assigned to him, or her, in the best possible manner, even down to the smallest detail, and Willard E. Alter, one of the salesmen, who has been with the house for quite a number of years, but is leaving to settle in California, told of his early experience with the firm. After this there were songs, recitations and instrumental music by those present. About 100 people were present at the dinner, which was one of the most successful that has been held, marking as it does the close of the most prosperous year in the business of this concern.

## OTT-HEISKELL HARDWARE COMPANY.

THE well-known firm of Ott Bros. & Co., Wheeling, W. Va., who were established in 1836, were incorporated January 1 under the style of Ott-Heiskell Hardware Company, the capital being $150,000. The officers of the new company are as follows: D. L. Ott, president; W. P. Heiskell, vice-president; D. A. Taylor, secretary; H. O. Ott, Jr., and A. B. Heiskell, additional directors.

## THE HAYDEN-CORBETT CHAIN COMPANY.

THE HAYDEN-CORBETT CHAIN COMPANY, Columbus, Ohio, isue a neat illustrated catalogue relating to their line of Chains. They call special attention to their Quality Chains. They refer to their equipment as adapted to the manufacture of high grade Chain, their shop being primarily a coke fire shop. It contains 60 fires, 30 of which are equipped with the new Corbett power hammer; they have 12 large dolly fires. The company manufacture Proof, B. B., B. B. B., Steel Loading, Dredge and Crane, Block, Wagon and a few Heel Chains.

JOHN H. PARKS announces the discontinuance of the Boston office which he has maintained for the past 12 years, and hereafter his address, on general business matters, will be care of Æolian Building, 362 Fifth avenue, New York, which is opposite the Waldorf-Astoria Hotel. His address, on strictly personal matters, will continue as heretofore, care of Waldorf-Astoria, New York. Mr. Parks was compelled to make this change on account of the large growth of his business, which necessitated the bringing of the detail clerical work to New York, where it might be under his immediate daily supervision.

The Hardware store of J. Sage, 78 Main street, West, Rochester, N. Y., was robbed on the 30th ult. of nearly $1000 worth of Pocket Cutlery. Most of the Cutlery was the product of the Cattaraugus Cutlery Company, Little Valley, N. Y., and is so marked, a fact which may be of interest to any of our readers to whom the stolen goods may be offered for sale.

The Meyer-Neville Hardware Company, Meridian, Miss., have opened a branch retail store at Gulfport, Miss., which is referred to as fast coming into prominence as a free port. Improvements are in progress covering an expenditure of over $2,000,000 in the way of harbor improvement, large hotel, business blocks, &c. This concern expect to add Ship Chandlery to their stock just as soon as adequate quarters can be obtained.

## CALENDARS, &c.

DAVIS & FARNUM MFG. COMPANY, Waltham, Mass.: Engineers, founders and machinists.

WADSWORTH-HOWLAND COMPANY, Chicago: Manufacturers of Paints and Colors.

C. H. CASEY, Jordan, Minn.: Dealer in Hardware and Machinery.

A. B. WARE & Co., Opelika, Ala., and Columbus, Ga.: Their calendar illustrates "one of the 750 country stores who buy Hardware and crockery" from them.

NEWHALL CHAIN FORGE & IRON COMPANY, 9-15 Murray street, New York: A dainty desk calendar.

F. E. MYERS & BRO., Ashland, Ohio: A large hanger calendar in which many illustrations are given of their Pumps, Hangers, Hay Tools, &c.

JOHN ROURKE & SONS, Savannah, Ga.: Founders, machinists, blacksmiths and boiler makers.

NEW JERSEY FOUNDRY & MACHINE COMPANY, 9-15 Murray street, New York: An attractive calendar intended for desk use.

PHILIP CAREY MFG. COMPANY, Lockland, Ohio: Carey's Magnesia Flexible Cement Roofing and 85 per cent. Magnesia Steam Pipe and Boiler Coverings.

THE SNARE & TRIEST COMPANY, contracting engineers, 39 Cortlandt street, New York.

THE BOEBINGER HARDWARE COMPANY, 315 East Pearl street, Cincinnati, Ohio.

THE BERGER MFG. COMPANY, Canton, Ohio: Hanger calendar, the feature of which is an illustration of their extensive sheet metal works.

SICKELS, PRESTON & NUTTING COMPANY, Davenport, Iowa: In wishing their customers and friends a Merry Christmas the company issue in admirable form half a dozen reproductions of modern paintings. These have been taken from the originals by color photography and comprise "In the Pasture," "Moonrise Before Sunset," "November Day in Old Virginia," "A Sage Adviser," "Expectation," and "President McKinley's Favorite Team."

BUCKEYE ENGINE COMPANY, Salem, Ohio: The company are Engine builders, a fact which is brought out in the illustration which occupies the place of honor in the calendar.

KIRCHER & SON, Belleville, Ill.: This old established retail Hardware house issue two calendars, one being for desk use and the other a large lithograph hanger.

THE BOURNE-FULLER COMPANY, Iron, Steel and Pig Iron, Cleveland, Ohio: Calendar for 1903 illustrates "The Village Blacksmith."

LINCOLN IRON WORKS, Rutland, Vt.: Stone Working Machinery. The subject of the picture is "Innocence."

THE SIMPLEX TIME RECORDER COMPANY, Gardner, Mass.: Their calendar for 1903 presents a picture entitled "The Old Reaper."

PRATT & WHITNEY COMPANY, Hartford, Conn.: Taps, Dies, Reamers, Gauges, Milling Cutters, &c.

DETRICK & HARVEY MACHINE COMPANY, Baltimore, Md.: Daily calendar for 1903.

SALEM ELEVATOR WORKS, Salem, Mass.: Elevators.

TIPPETT & WOOD, Phillipsburg, N. J.: General contractors in iron work. A desk calendar with thermometer attached.

THE THOS. DAVIDSON MFG. COMPANY, Montreal, Canada: Small tray of an attractive character calling attention to their plant and manufactures in Enameled Ware.

CITY FORGE & IRON WORKS, Dayton, Ohio.

H. G. CORMICK, Centralia, Ill.: Retail dealer in Hardware, &c.

THE EASTERN GRANITE ROOFING COMPANY, Irving Building, New York: A unique calendar printed on Japanese wood veneer.

JOHN W. RAPP, East Nineth-fourth and Ninety-fifth streets, New York: Rapp Complete System of Fire Proof Construction.

## AMONG THE HARDWARE TRADE.

Mitchell-Powers Hardware Company, wholesale Hardware, Bristol, Tenn. and Va., have bought a brick warehouse, 90 x 150 feet, on Cumberland street, one square from State, which they have fitted up for their business. They are also putting another story on their wareroom, 50 x 100 feet, in the rear of their main building, 613 and 615 State street, 50 x 150 feet, five stories. Next spring the company are intending to erect another warehouse near N. & W. and Southern depot, so that cars can enter to load and unload.

Marshall & Noble is the style of a new firm who will commence business at Lyons, N. Y., on February 1. The members of the firm are A. E. Marshall, who purchased the Redgrave stand soon after the death of S. C. Redgrave, and Charles A. Noble, who has just withdrawn from the concern of Noble & Hartman. Mr. Marshall came to Lyons from Cazenovia about two years ago and has conducted a large and successful business. During the past year he has greatly increased his stock and has gone into the Farm Implement and Machinery branches until the business has become one of the largest in the county. Mr. Noble has enjoyed an equally successful career in the same line of trade and is besides more widely known in Lyons territory.

D. M. Johnson has bought the Hardware, Stove and Tinware business of T. L. Davis at Weeping Water, Neb.

McCrary-Redding Hardware Company, Asheboro, N. C., have under construction a new brick building, 32 x 110 feet, two stories and basement. They expect to occupy it about February 1.

Boyett & Gunn have purchased the stock of Simpson & Co., Cuthbert, Ga., and under the style of Cuthbert Hardware Company will continue the wholesale and retail Shelf and Heavy Hardware, Stove, Tinware, Agricultural Implement and Sporting Goods business. The firm are making a number of improvements in their establishment, which, when completed, will make it one of the best arranged and most attractive stores in southwestern Georgia.

Felska & Ellingboe have succeeded Ellingboe & Oie in the Hardware, Stove, Tinware, Farming Implement and Sporting Goods business in Sacred Heart, Minn.

George Montgomery and his son, Fred. Montgomery, have purchased Ed. A. Newton's Hardware business in Rosedale, Ind. They will continue under the style of Montgomery & Son.

C. S. Cunningham has lately embarked in business at Pickford, Mich., handling Shelf Hardware, Tinware, Stoves, Paints and Oils, Furnaces, &c.

Dillsburg Hardware Company, Dillsburg, Pa., have sold out to Smyser, Creager & Co.

O. F. Tomlinson has lately opened up a new stock of Shelf and Heavy Hardware, Agricultural Implements and Buggies and Carriages, at Liberty, Mo.

R. H. McAlpine, dealer in Hardware, &c., Amarillo, Texas, has disposed of his business to Stringfellow & Hume.

The business of W. N. Crenshaw at Fayetteville, Ark., has been purchased by W. T. Farrar & Co.

Laughlin & Pitstick have recently entered the Hardware field at Talbot, Ind.

A. C. Raymer is about to remove his wholesale and retail Hardware stock from Omaha, Neb., to St. Paul, Minn.

F. M. Bridges has purchased the Hardware business of W. P. Inks in Goodson, Mo.

Purnell & Comstock, dealers in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Paints, Wagons, &c., Merrillan, Wis., have dissolved. Geo. W. Purnell is successor under his own name.

## PRICE-LISTS, CIRCULARS, &c.

THE CLAUSS SHEAR WORKS, Fremont, Ohio, New York office, 290 Broadway: Fine Shears and Scissors. An illustrated catalogue is devoted to an extensive line of Shears, Scissors, Razors, Razor Strops, Serrated Edge Knives, Meat Chopper and Emery Steel.

NORTH BROS. MFG. COMPANY, Philadelphia, Pa.: Ice Cream Freezers. An illustrated catalogue under date January, 1903, is devoted to Lightning, Gem, Blizzard and Crown Freezers; Packing Tubs and Cans, Ice Breaker, Chippers and Ice Shave.

THE KENTUCKY CHAIN COMPANY, Frankfort, Ky.: Price-list illustrating Wrought Breeching Rings. The company also manufacture Wrought Harness Rings, Repair Links, Lap and Open Rings and Chain.

FITCHBURG FILE WORKS, Fitchburg, Mass.: Hack Saws. An illustrated catalogue is devoted to Hack Saw Frames and Blades. The latter are made under two brands, "The Best" and "Culley," the Culley being a flexible blade.

THE HART MFG. COMPANY, Greenville, Ohio: Catalogue illustrating Screen Doors, Window Screen Frames and Screen Windows for 1903.

J. A. WRIGHT & Co., Keene, N. H.: Price-list circulars relating to Silver Cream Polish and New Century Metal Polish.

THE STAVER CARRIAGE COMPANY, Chicago, Ill.: Illustrated catalogue of Buggies, Phaetons, Surries, Carriages, Road Wagons, &c.

THE PONTIAC SPRING & WAGON WORKS, Pontiac, Mich.: Catalogue illustrating Road and Driving Wagons, Buggies, Surries, Laundry and General Parcel Delivery Wagons, Milk and Bakers' Wagons, Passenger Wagons, Mail Wagons, &c. The company make special reference to their line of Delivery Wagons.

CARGILL, COOK & Co., Westfield, Mass.: Whips. These are illustrated with descriptions in a catalogue which is accompanied by a special price-list.

OLIVER CHILLED PLOW WORKS, South Bend, Ind.: Illustrated catalogue reresenting all the Plows which the company supply to their domestic trade. The company refer to the fact that their manufactures are confined to Plows alone.

THE OHIO FOUNDRY COMPANY, Dayton, Ohio: Catalogue of Gas Appliances, showing Allen Enterprise Burners, Nos. 2 and 3, Independent Water Tank Burner, High Power Furnace Burner, Dayton Burner, Super-Heating Gas Burner, I X L Odorless Grate Burner, &c.

THE AMBLER SAW MFG. COMPANY, Natick, Mass.: Circulars relating to Band and Circular Saws, Band Saw Tools and Machinery. The company are also issuing stickers for pasting on machines on which the length of Saws may be noted, so that band sawyers may always have the exact length of their Saws before them. They refer to business as exceptionally good, being crowded with orders.

BUTLER BROS., Chicago, Ill.: In the January issue of their catalogue, which is styled "Our Drummer," and contains more than 360 pages, is a chapter on "Resultful Plans," for pushing trade "when trade is tired." These are designed with special reference to the mid-winter season. Reference is also made to their profit sharing plan, which has now been running six months, and is said to have been proved a success by the hard test of results. The company allude to this month's yellow page specials as possessing unusual interest to dealers (whom they sell exclusively) who desire leaders or drives.

## COES WRENCH COMPANY.

THE COES WRENCH COMPANY, Worcester, Mass., who are represented in New York by J. C. McCarty & Co., 10 Warren street, and John H. Graham & Co., 113 Chambers street, have recently increased their manufacturing facilities and are calling prominent attention to their Wrench, the patent on which was issued 63 years ago and on which improvements have been made from time to time. Some of the cardinal points to which they direct special attention in their Knife Handle Screw Wrench are the hardened steel bar and jaw, the steel castings in handle; the screw, which, instead of being made of soft iron or in two parts, is hardened steel; the steel rivet and key; the hardwood handle, and the quality of the workmanship throughout and the finish. They are emphasizing the fact that the term "Knife Handle" in connection with this wrench is theirs by right of registered trade-mark and that they are taking steps to protect it. They suggest that the trade bear in mind that if their name is not on a wrench it is not a Coes.

## THE JACKSON KNIFE & SHEAR COMPANY.

THE JACKSON KNIFE & SHEAR COMPANY, Fremont, Ohio, issue an illustrated catalogue and price-list relating to Shears, Tinners' Snips, Pocket Knives, Razors, Butcher and Serrated Edge Knives. The company have added quite a number of new patterns of Knives, and have discontinued making several old patterns, which do not appear in their new catalogue. They refer to business during the past year as having been exceedingly good, and expect 1903 to do even better.

## AMERICAN BOLT COMPANY.

A CONSOLIDATION has been effected of the interests of the American Bolt Company, Lowell, Mass., and the Southern Bolt & Nut Company, Birmingham, Ala., who will be known as the American Bolt Company. The removal at an early date of all the machinery at Lowell to Birmingham is contemplated, so that the former plant will be discontinued.

## TRADE ITEMS.

ON January 1 the corporate name of E. Jenckes Mfg. Company, Pawtucket, R. I., was changed to Jenckes Spinning Company, and the manufacture and sale of cotton yarn will be continued under that title. The manufacture of Knitting Machines, Wire Goods, &c., will be carried on by a newly chartered corporation to be known as E. Jenckes Mfg. Company. Both corporations will be managed by the officers of the former company. An additional factory now in course of erection and the division of the business as above will give both corporations materially increased facilities.

THE FRANKLIN STEEL WORKS, Boston, Mass., manufacturers of the Standard Toe Calks, are to establish a branch plant at Joliet, Ill., to take care of their Western trade. They have bought the plant formerly occupied by the Joliet Wire Company and expect to have it in operation about February 1. The property consists of 5 acres of land and a brick and stone building 208 x 60 feet, in good condition, connected with the railroad by a spur track. They state that the new plant will be in the center of their Western trade and that they will be in a position to supply this trade to better advantage than from Boston. They will continue to operate the Boston plant and will supply their Eastern trade from that point. The Western plant will be in charge of Treasurer Walter F. Pitcher. The president and general manager, Joseph J. Durham, will spend some time at each plant. Most of the equipment for the plant has been bought excepting a gas or gasoline engine of 25-30 horse-power.

HUNT, HELM, FERRIS & Co., manufacturers of Star Hay Carriers, Tank Heaters, Hand Sleds, Barn Door Hangers, Corn Huskers, Wire Stretchers, Door Hinges, &c., Harvard, Ill., tendered a banquet to their salesmen at Ayer's Hotel, in that city, on the 30th ult. The occasion proved to be a most enjoyable one. The following is a list of their salesmen, with the territory covered by them: H. A. Sheldon, Wisconsin; A. C. Davis, Nebraska and Western Iowa; Geo. R. Brereton, Southern Minnesota; A. C. Chamberlain, Iowa; W. O. Tobias, Missouri; G. P. McDermott, Indiana; Howard Seely, Michigan; G. W. Hamilton, Ohio; Frank G. Hood, New York; A. R. Fuller, Northern Minnesota and North Dakota; A. A. Lauder, Illinois; J. S. Wood, Kansas. The company report a very prosperous condition of things during the past year and are confident that the demand for the Star line will be even larger during 1903.

THE firm established in 1865 and at the present time conducted as a private copartnership under the style of F. W. Heitmann & Co., Houston, Texas, have just incorporated under the laws of Texas and will hereafter be known as F. W. Heitmann Company. This will not affect or change the management of the business in any way, as those heretofore conducting its affairs will continue in charge.

THE annual gathering of the traveling representatives of Robinson Bros. & Co., Louisville, Ky., was held a short time since. Harry E. Pfingst, secretary of the company, presided as toastmaster, and introduced the speakers of the evening, as follows: Joseph Wanless, "The Ti Ki Movement;" C. P. Robinson, "Credits;" E. H. Massie, "The Traveling Man;" R. A. Robinson, "Co-operation;" J. H. Neil, "Selling Specialties." J. West Massie presented the principal topic of the evening, "What is a House's Duty Toward Its Traveling Salesmen," which was followed by a general discussion. The company refer to these annual gatherings as bringing about a closer relationship between employer and employee, resulting in great good all around.

THE BAYONNE KNIFE COMPANY, whose New York office has been located at 57 Warren street, have been compelled, by the increasing volume of their business and insufficiency of capacity at the old address, to secure larger quarters. They are now at 105-107 Chambers street, where they have an entire floor, 150 x 25 feet, extending through to Reade street. They are intending to fit up a new sample room and install a line of display cases. Among the goods they produce are Pocket Knives, Scissors, Shears and a full line of Silver Plated Hollow Ware and Table Flat Ware.

## CAPEWELL HORSE NAIL COMPANY.

CAPEWELL HORSE NAIL COMPANY, Hartford, Conn., are issuing a circular in which a view is given of the new plant, almost completed, which replaces the one destroyed by fire on July 3, last. The old plant was very large and well equipped, but the growth of the company's business made it necessary in planning the new establishment to arrange for floor space and machinery much in excess of their former equipment. The main building is one of the largest factory buildings in the New England States, and the whole plant is as nearly fire proof as possible, the walls being of brick, floors and roofs of concrete and stairways of iron. All practical up to date improvements which will add to the comfort of employees or contribute to the perfection of their product have been introduced. When the fire occurred the company had about 1000 tons of Nails in a fire proof storehouse which the flames did not reach. At their branches in various parts of the United States they had nearly 1000 tons more. From these stocks orders were filled until machinery could be set at work in rented quarters, and in temporary buildings, which were quickly erected on their factory lot. The fire might have been a serious blow to the company, but they have been most fortunate in securing prompt delivery of all materials and machinery needed, and the large amount of machinery at this time in running order makes it absolutely certain that there will be no interruption whatever to their business.

## BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK STREET, LONDON, W. C., Dec. 24, 1902.

### Trade Prospects in India.

AS I am writing this week the day before Christmas, it will readily be understood that there is not much talk of business in England. I therefore take the opportunity of referring to trade conditions and prospects in other parts of the world. During the year I have had occasion to refer several times to India. My information is to the effect that the Indians in all the presidencies are looking forward to a period of commercial expansion in the near future. For the past two or three years they have been victimized by plague or famine or drought or all three combined, and the consequence has been the withering of many a little commercial growth. One of the best tests of the activity of Indian trade is to be found in its railway returns. During the past few weeks I have been gathering these returns with some degree of vigilance, and the results are certainly interesting. Thus, in regard to the Bengal Central Railway Company, a dividend for the half year of 2½ per cent. is paid. The gross earnings, as compared with the first half of last year, were Rs. 29,585 less, owing to smaller receipts from sundries. The receipts from coaching traffic were fairly satisfactory and continue to exhibit a steady increase. The goods traffic shows the total earnings to be more by Rs. 7814, this being mainly due to heavier exports of jute. In respect to the current half year, the returns point to a less satisfactory result. The Southern Punjaub Railway Company say that, bearing in mind that there was a failure of the monsoons and winter rain in 1901, they have reason to congratulate themselves that the receipts are so satisfactory. The company pay 4 per cent. In regard to the Nizam's Guaranteed State Railways Company, the goods traffic increased by Rs. 99,695. The Southern Mahratta Railway Company, Limited, report a very distinct improvement in every branch of traffic amounting to 7.28 per cent. The Bengal & Northwestern Railway report an increase in goods receipts of Rs. 100,000. The East India Railway Company state that the gross receipts for the half year ended June 30 exceeded those of the corresponding period of 1901. (Rs. being the abbreviation for Rupee, value about 32½ cents.)

It will be seen from these few figures that, notwithstanding adverse conditions, the tendency of the goods traffic is to increase. I have before pointed out that while the middle and upper sections of the population in India would seem to be increasing in prosperity, the rayats are still plunged in dire poverty, and something must speedily be done to put them on a sounder economic footing and so increase their purchasing capacity. Sir H. J. S. Cotton, up to recently the Chief Commissioner of Assam, has given considerable attention to this problem, and his conclusions are always canvassed with interest by Indian students. In his opinion the greatest material boon which can be conferred on India would be the restoration of her manufacturing industries. He thinks that the greatest material calamity which India has been confronted with for so many years has been the gradual extinction of her manufactures. Indian manufactures have undoubtedly been thrust out by British competition. In the palmy days of the East India Company a portion of the revenue was set apart for the purchase of manufactured goods for export, but since then the tendency has been to throw the population into the agricultural industries. The old arts in which India excelled are dying out, and the urban populations have decreased so that now there are only some 15 per cent. of the population employed in manufactures, as compared with 80 per cent. in Great Britain. No doubt this gradual extinction of artisan crafts has created the poverty of the people of India. They are actually and relatively poor, and according to the Viceroy, the average income of the people of India does not exceed $10 per annum. Famines, which are the curse of India, are not so much caused by want of communication, or even of irrigation, but from sheer inability to buy food.

It is not to be expected that this state of things will continue indefinitely, and it is, indeed, notorious that strong efforts are being made to encourage Indian crafts again. For example, the equipment of the native army in India is to be manufactured locally from the beginning of the new financial year. The various items of this equipment were of English manufacture until the South African campaign gave the factories at Cawnpore, Bangalore, Madras and other industrial centers an opportunity of showing what they could do in the manufacture of durable accoutrements and camp equipment. The result proved so satisfactory that samples have been called for by various local authorities, and sealed patterns have been deposited as the standards of future supplies. The Madras School of Art is engaged in experimental metal work, and the pupils are expected when they leave it to stimulate Indian manufacture. As it is, India is a very large purchaser. For example, in 1901 she purchased Rs. 1,757,563 of Hardware and Cutlery, while her purchases of machinery mill work reached Rs. 2,257,559. She also bought very heavily copper and brass (171,870 cwt.), iron goods (169,992 tons), spelter (71,572 cwt.), steel (92,586 tons), tin (22,741 cwt.), lead (122,264 cwt.). In the same year India bought 72,376,898 gallons of kerosene, 216,662 cwt. of paints and colors, and 1,341,120 Rs. worth of railway materials. Thus, notwithstanding all the difficulties with which India must contend, I have no manner of doubt that before many years have elapsed those who cultivate the Indian market will be well repaid for their trouble.

### Trade Prospects in Siberia.

It is not relatively a far cry from India to Siberia. In considering trade prospects with India, therefore, it is as well to remember that lying north in the Continent of Asia is another potential market of no small importance. Your readers are, of course, aware that for the last few years Russia has been extending her railway connections across Siberia, and there is now actual railroad connection with the Pacific Ocean. I am not sure whether Lake Baikal is not the only break in the line. Starting from Cheliiabinsk on the eastern side of the Urals, the Siberian Railway winds along to Irkutsk, generally on the fifty-fifth parallel—that is, within the same degree of latitude as Moscow. Irkutsk lies close to Lake Baikal, and may be said to be in embryo the Chicago of Siberia. In a sense it divides the east from the west. Traveling east to Lake Baikal the line is carried clean through partly across Chinese territory to Vladivostock, while another branch runs down to Port Arthur on the Gulf of Pe-chili. A glance at the map will show that Port Arthur is the natural port and the strategic defense or attack of Pekin.

Regular traffic is now open to the Manchurian frontier station and by next year the entire route from Europe to the Pacific will be open to the public service. Trains have already run through to Vladivostock and Port Arthur. Thus in August of this year Prince Komatsu and suite accomplished the whole journey from Moscow to Port Arthur by a special through train in 14 days, but early in the new year a regular passenger service will be established. As regards the one break in the through route to the Far East, the short stretch round the Siberian bend of Lake Baikal is to be ready by January 1, 1905. Meantime the ice breakers and steam ferries across the lake will maintain the continuity of through traffic.

I remarked that Irkutsk or Lake Baikal was in a sense the Chicago of the vast Siberian territory. The western portion, extending to the Urals, and including the so-called granary of Siberia, is almost exclusively agricultural, grain and cattle rearing being the chief avocations of the population. Its produce, more especially grain, butter, eggs, game, &c., reaches the markets of Western Europe. The eastern portion traversed by the railway route and extending from the lake to the Manchurian frontier lies in a region mainly mineral. Unlike the western districts of Siberia, this Trans-Baikal territory produces as yet little, if anything, for export to European or other markets. For the development of its mineral resources labor, machinery and even food products will probably find their way mostly from or via the Far East. The country west of Lake Baikal

will, therefore, trade more directly with Russia and Europe, and chiefly in the export of its own agricultural produce, while the Trans-Baikal will come rather within the range of enterprise directed from the Pacific and apparently should as yet develop rather an import than an export trade.

The commercial nations of the world, particularly Great Britain, Germany and America, are more concerned with the commercial than with the official prospects of the Trans-Siberian Railway. The trade connections of western Europe with the nations of the Pacific are incomparably greater than those of Russia herself with either China or Japan. Russia's trade intercourse with her Asiatic neighbors is comparatively small. Siberia itself so far, with the exception of its grain and more recent butter trade, may be said to have no very noticeable international commerce. It has no manufacturing industry, the country is more or less undeveloped; the population is about 8,000,000, engaged in agricultural pursuits. We must therefore look to Siberia and its new railway for its future potentialities, which may be roughly summarized as, 1, the connecting medium between the far Eastern possessions and the heart of Russia and as another outlet to the ocean; 2, as the means of facilitating and furthering direct trade in the future with China and Japan; 3, as a great transit route for passengers, goods and mails between east and west, and *vice versa*, and, 4, the railways must be regarded as an instrument for the colonization and opening up of Siberia. Indeed, the railway has to create rather than to carry traffic. It has already served as a spur to the colonization and civilization of this vast expanse of territory, whose very name has hitherto connoted in our minds the idea of isolation, if not of desolation. But Siberia is undoubtedly rich in raw materials, its population is thrifty and ambitious, and before many years have elapsed will be buying in good quantities.

The first district to be affected will be Manchuria, whose import trade amounted to $13,000,000 in 1899 and over $14,000,000 in 1901. The imports from the United States in 1899 reached the sum of $5,000,000. Since that year the imports of Nails and Lamps have trebled, while the import of Sewing Machines has increased by leaps and bounds, and would do so on an even greater scale without unnecessary polish and ornamentation, which adds to the price. Among the goods for which there is now a ready sale in Manchuria may be noticed Lamps, Agricultural Machinery, Sickles, Scythes, cheap Plows, Kerosene, Lubricating Oils, Wall Paper, Furniture, Leather Good and Harness. Foreign trade in this district, and, indeed, generally throughout Siberia, has hitherto been largely in the hands of a few big firms established in the country itself and dealing in Russian and foreign goods and commodities of all descriptions. Their central establishments, at Vladivostock, Khabarovsk, Nikolaievsk-on-Amoor and Blagovestchensk, with branches scattered over the smaller towns and villages, are really general stores and agencies doing wholesale and retail business in a wide range of goods, trading in everything practically from Agricultural Machinery to groceries. Three such firms, now old established, one Russian, one German and the third American, have held a practical monopoly in far Eastern trade so far as Russia's possessions in that region are concerned.

The closing of the free ports, the shifting of traffic routes, the practical suspension of the Amoor River traffic, and the total abandonment which now looms over the lately rising trade of the whole Amoor region, owing to the completion of the Manchurian railway, have affected the character and extent of these firms' former exclusive hold on the trade of the country. The conditions, in fact, are changing. The American, after 30 years of profitable business, is now partially curtailing his trade operations. The movement of trade is, of course, toward the railways. For a long time to come we must look to these large general houses to buy and sell Hardware and metal goods generally. Siberia is too vast and its interior too undeveloped to be fed from any one central point in any one class of articles only. In time, with the development of the mineral and other natural resources of the country, mostly with the aid of foreign capital, a demand will arise for improved machinery and technical appliances which Siberia itself cannot supply and Russia can only partially supply.

## AUSTRALIA. 1902-1903.

BY OUR SPECIAL CORRESPONDENT.

### A Retrospect and Forecast.

A YEAR ago *The Iron Age* published a *résumé* of the business of 1901 in the industries covered by it, with comments on the outlook for 1902. Australia had no place in the retrospect or in the forecast, but since that date the country appears to have had a certain amount of advertising. This advertising has, unfortunately, not always been of the kindest nature. And still more unfortunate is the fact that the advertising referred to has been fairly accurate as a whole. The letters which have appeared in *The Iron Age* during 1902 have kept your merchants posted to a certain extent, and their private advices have undoubtedly borne out *The Iron Age* reports. The drought, that horrible word which is synonymous with the term "Australia" for the time being, has not so far had so very marked an effect on exports from New York to this country. Orders have been fairly free until the past few months, merchants here having been buoyed up with hope that rain must come. But it has not come, and summer, our dry season, is upon us. Stocks are heavy throughout the commonwealth, and ordering in 1903 will be light. There must always be turnover where there is population, but enterprise is having a severe check and capital is being husbanded till such time as a good season returns.

Nineteen hundred and two has not seen anything like the usual expenditure on public works, railway construction, mining development, or speculative building. Government retrenchment has accounted for the first two; decreasing population owing to the attractions of South Africa, decreasing income among traders (with consequent tightness of money and retrenchment of employees), having accounted for the latter. And it is especially noticeable in Australia how immediately and directly the welfare of the people is affected by the expenditure or otherwise of the State finances. The Government here has a direct personal influence over every individual, acting largely in the capacity of a milch cow. Our railway systems, too, are entirely State owned, and are not always managed in a commercial spirit.

### The Outlook for 1903

is not encouraging. It is, in some degree, traitorous to write even in the least pessimistic tone of one's own country, but it would be folly to paint bright colors where they do not exist. The landscape is gray, and our sun has not yet risen high enough to introduce the golden tints. Opinions differ, but the most competent authorities estimate our shortage of exports in wool, wheat, butter and meat at about £5,000,000 for the whole of Australia. And a considerable amount of importation of wheat, maize, barley and meat foods is inevitable. Again, the Australian States, with their extravagant administration, are coming in for a fair share of condemnation from the London financial papers, and the London money market shows signs of getting tired of Australian loans. Even Australians are beginning to feel their country deserving of the epithet, "Spendthrift Australia," recently applied to it by a London paper.

The Governments here tackle reduction of expenditure in a very half hearted way, and the London market is averse to further loans except on high terms. The flotation of local loans will have the effect of making the Governments competitors for money and thus increasing rates for loans and discounts. And it would be rather hard to be faced with dear money on top of our present troubles.

With regard to the shortage of wheat, the actual estimate of importation necessary to cover the Australian shortage is 200,000 tons, pretty well all of which will come from San Francisco, from which port several ships are already on the way, and will presumably take back

loading of coal from New Castle, New South Wales. The market quotation here is 6 shillings a bushel (the record price is 6 shillings 1 pence), say, about twice the normal price.

THE STATE OF VICTORIA, as previously pointed out, has suffered but little in comparison to her northern sisters. The depression in this State will be comparatively transitory. The drought has undoubtedly hit the Mallee country, as the northern part of the State is called, very hard. In one portion of the State, in the northern district, one patch of country containing 40,000 square miles, and with an agricultural population of 217,000, figures out its losses so far as nearly £4,000,000 sterling, say $20,000,000. These figures only cover one small corner of the country. The total losses must be many times that amount.

As against the extreme losses of the northern part of the State the prosperity of the southern part must be considered. Producers south of the Dividing Range, which bisects the State, live within the area of normal rains and get the benefit of coastal rains to some extent. In this southern half, although production has been far below the average, still the producer has been to a large extent recompensed by the increased prices obtainable for produce. Wool is selling at 25 per cent. increase on last year's prices; oats, chaff and hay fetch fabulous prices, so that the more favored districts are simply coining money at the expense of the less favored, the position thus resolving itself to some extent to a transfer of capital from north to south. Of course this is not healthy, but it puts the case in the least unfavorable light.

IN NEW SOUTH WALES the Sydney *Daily Telegraph*, referring to the depression in that State, estimates the loss during the next 12 months to work out at about £7,500,000.

QUEENSLAND figures are not available, but this State has suffered at least equally. Tasmania and Westralia alone are fortunate in escaping such loss, and these States act as a brake upon the stagnation of the larger States.

THE COLONY OF NEW ZEALAND sends along healthy statistical returns for the 12 months ending September 30, 1902, showing exports to the value of £13,300,000, an increase of £550,000 over the preceding year. Imports, £11,250,000, are nearly £700,000 short of the preceding year. Reduction in tariff accounts for a good share of this, and the preceding year was, owing to various local causes, somewhat of a boom year, so that there is really no falling off below normal value of imports. Hardware travelers regard New Zealand as quite a happy hunting ground by comparison with Australia, and there is every indication of continued prosperity.

### The Hardware Outlook.

The foregoing general remarks will aid your merchants and exporters to understand Australia's position. Naturally they must bear some share of burden by being penalized in loss of trade. It is a fair statement though, from actual personal knowledge of the men, that neither British nor German travelers, having Australia as their territory, purpose relaxing their vigilance. *Verbum sap.* Orders are falling off. These travelers are not.

The outlook for Heavy Iron and Steel is depressing, due to lack of Government and municipal funds, two of the chief factors. Mining Tools and Machinery will be slow, this trade being directly affected by the drought, inasmuch as a good deal of the gold bearing country is drought stricken. Artesian Well Boring Tubes and plant ought to have a good future, though not this coming year.

Foundry iron and foundry requirements will be small and limited to absolute day to day necessities.

Perhaps your correspondent is pessimistic, but it really appears from present indications that 1903 is going to "slump" in Hardware circles.

Builders' Ironmongery, Joiners' Tools, Carpenters' ditto—what is there to make one hopeful? Certainly no outlook. It is much cheaper to buy than to build. General household and furnishing Ironmongery, thank heaven, are always required, and it is to be hoped they will keep us going.

In Lamp Ware America leads easily and must continue to lead. The center draft Lamp holds popular favor here. It does not seem to be so universally used in England, consequently British makers will not alter their plant, or lay down fresh plant to sufficient extent to disturb America's supremacy.

### Recent Federal Customs Decisions.

It must not be forgotten that the Victorian system of estimating the value of goods by adding 10 per cent. to invoice cost and then imposing the duty on the full amount has been adopted by the Federal authorities as the method of obtaining Australian values.

Hardware decisions during the past month have been as follows:

Hanging Lamps (not electric): Reflector or shade, 20 per cent; chimney, 20 per cent.; all other parts, 15 per cent.

Glass Shades (electric), 20 per cent.

Box Nailing Machines, 12½ per cent.

Woven Wire Fencing Machines, 12½ per cent.

Engineers' Studs, consisting of a bolt threaded at each end of the nut, as used for clamping metal, 12½ per cent.

Wood Blocks (with holes bored, for use in electrical work), 20 per cent.

### Railways.

The Minister for Railways in Western Australia, replying to questions in the local House of Representatives, recently stated that of 1000 Cast Steel Drag Hooks obtained from a New York house at a landed cost of 7 shillings 3 pence each, only 701 stood the necessary tests for traffic purposes.

Victorian railways are pursuing a course of keen retrenchment. The rolling stock, however, is in poor condition and must shortly call for expenditure of money.

### Shipwreck.

Mr. Anderson, representing Hood, Haggie & Co. of Newcastle, England (Wire Ropes), and Sybry, Searls & Co., Sheffield (Steel), and who was well known in the Australian Iron and Steel trade, lost his life in the wreck of the "Elingamite," off the New Zealand coast. Mr. Anderson was in the third mate's boat, which has not been heard of since the wreck, two or three weeks ago, and all hope has been abandoned. Several engineers and employees of the Auckland electrical tramway service are also missing, and some of the survivors underwent horrors on a raft which recalled the story of the "Medusa." The "Elingamite" had a fair quantity of Hardware on board for Auckland firms, transshipments from Sydney.

The Commercial Travelers' Association of Victoria shows a net profit of £5285 for the year ending September 30. About one-third of this sum has been disbursed in benefits, leaving a surplus of £3500 on the year's working.

The Agricultural Machinery Association of Victoria has subscribed £128 to the Drought Relief Fund, which now totals over £8000, the Melbourne Hardware houses having subscribed over £600.

### Window Displays.

A noticeable feature here in Australia is the daily increasing tendency of the public to purchase almost entirely from window displays. Another noticeable feature is the obtuseness of many of our Hardware dealers in neglecting to note, and provide for, public requirements in this respect. Window display is only advisable, or rather only necessary, for household Ironmongery. A window of heavy goods would be time, space and money wasted, for the simple reason that these lines are requirements of builders and traders only. But household lines appeal to the ladies, who have become almost entirely the purchasing members of the household. It is only within the last few years that the fair sex have usurped, or perhaps we had better say assumed, the privileges of mankind in choosing the furnishing Ironmongery. That they have done so is undeniable, and, this being the case, it is curious to note how slow Hardware stores here are to admit the fact, or, admitting it, to take advantage of it.

The writer knew them in England not many years

ago and knows them in all the chief cities of Australia to-day. Take the best of the latter, which it may be safely assumed are in the city of Melbourne, and note the few attractions provided by the windows. Occasionally some brilliant genius provides a window display illustrative of a man on horseback, a man-o'-war, or some such design, the whole constructed of a thousand and one different items of stock, bearing, it is true, some distant resemblance to what it is supposed to be, but resembling nothing so much as a medley of odds and ends of stock concerning the use of which the average passer by has no knowledge and requires none. To the ladies such a display is worse than useless. And again, where individual windows are devoted to individual classes of goods (and this system, properly carried out, is undoubtedly the best form of window advertising), how painfully similar the arrangement looks year in and year out. And the similarity of arrangement appears to the average man in the street to be reflected on the goods, so that, so far as he is concerned, they are just the same as those which were there three seasons ago. Yet new designs are as attractive in many Hardware lines as in the contents of a dry goods store. Hardware does not wear out so rapidly, it is true, and even price cutting will not compel a sale to the same extent that it would in, for instance, a line of cheap blankets of good quality.

But the average Hardware dealer will not learn that the man in the street, or his better half, do not realize that they require anything until it is shown to them. Or else he makes the mistake the other way, and seeks to cram into his window space the whole contents of his shop in one huge jumble. Put a line of Hammers in, with a few Garden Tools, Screw Drivers, Picture Hangers, &c., when a holiday is due, so that the lady of the house shall be reminded of the excellent opportunity to get various little long deferred tasks performed. Watch every detail closely and always be on hand to take the first hold of opportunity. And see to it that the shop entrance is inviting, and not littered up with odds and ends likely to interfere with a lady's dress. And keep it clear of idlers. The writer recently saw a traveler and a head salesman conversing in the doorway of a leading Melbourne ironmonger's. A lady attempted to enter the premises, and neither of the men had sufficient courtesy to make way for her. After trying first one side and then the other, she gave up the attempt and swept indignantly away. The men still talked on, and the incident did not appear to trouble them in the least. It is safe to say they lost at least one customer by their stupidity, and the writer, who witnessed the incident, would not advise his wife to go to a shop where she might be subjected to such indignity.

## HILL DRYER COMPANY.

HILL DRYER COMPANY, Worcester, Mass., have recently issued attractive advertising matter referring to their well-known Clothes Dryers for balcony, yard and roof use. In some of the larger cities, notably New York, a line attached to a pulley is very generally used for clothes drying. This necessitates leaning out of the window to draw the clothes in and out and occasionally results in accidental falls from the window to the ground. J. P. Hill, designer of the Hill Clothes Dryers and manager of the company, has collected statistics of accidents of this nature, and they are said to be alarmingly numerous. By the use of Hill's Balcony Dryers it is claimed that such accidents are prevented, besides affording a much more sightly support and facilitating the rapid and even drying of the clothes by exposing all sides to the air. More than 200,000 of these Dryers, we are advised, are now in use in all parts of the world. Catalogue A, recently issued, illustrates the different styles of Dryers, including those adapted for use in balconies and yards and on roofs; also where there is no piazza the device can be attached to the side of the house and easily swung up to the fire escape or window balcony. The manufacturers state that these Dryers are made of the best material throughout, with all castings malleable iron and galvanized. The company are also manufacturing the Hustler Ash Sifter, and state that the present demand for these is very large, owing to the high price of coal and the recognized effectiveness of the Sifter.

## A GOLD MEDAL FOR MR. SUPPLEE.

SOMEWHAT of unusual significance is the fact of a gold medal having been awarded by the directors of the South Carolina Inter-State and West Indian Exposition, held in Charleston during last year, to William W. Supplee, president of the Supplee Hardware Company. This medal was awarded as a compliment to him for his work as chairman of the various trade organizations in his city in inducing manufacturers to exhibit their products, coupled with his efforts in securing the loan of the famous Liberty Bell, as well as the part taken in bringing about the erection of the Pennsylvania State Building and the Philadelphia Building on the grounds, which added so much to the interest of the exposition, and further in rendering his aid when the matter of appropriation was pending before Congress.

## GRAY & DUDLEY HARDWARE COMPANY.

GRAY & DUDLEY HARDWARE COMPANY, Nashville, Tenn., have leased a large and well located warehouse in Memphis, with both river and rail connections. They will carry in stock at this point Nails, Wire, Horseshoes, Shovels, Ammunition and a number of other staple goods. This arrangement will be of great benefit to the company's salesmen who travel the States of Mississippi, Louisiana and Arkansas. Since the first of the year the company have added eight more to the number of salesmen who have been working this territory. They feel confident that this is going to be a satisfactory and profitable arrangement, as the Southwestern country is in a prosperous condition and is rapidly growing and developing. The main house and office will continue at Nashville as heretofore; where all buying, correspondence and other work of this character will be transacted.

## MISCELLANEOUS NOTES.

### The Racycle.

The Miami Cycle & Mfg. Company, Middletown, Ohio, have made improvements in the construction of Racycles for 1903, including a combination crank wrench, which does away with the unhandy wire loop; the crank cups as now made have twice the thread surface previously used; the cups are knurled on the surface of the outer rims, and the slots in the bottom bracket are elongated in order to give a larger binding surface on the cups. The Racycle cushion frame pacemaker, model 80-A, with coaster brake, is referred to as being the most expensive chain wheel ever built. An illustrated catalogue shows these improvements and the complete line of wheels made by the company.

### German Lineman's Pliers.

The Utica Drop Forge & Tool Company, Utica, N. Y., for whom the Smith & Hemenway Company, 296 Broadway, New York, are direct representatives, marketing their entire product, are introducing some classes of goods of German manufacture for the use of the electrical trade in the way of drop forged pliers. One of them is a side cutting plier, No. 1050; another is of similar design, No. 1350, with the addition of a wire twisting device for joining the ends of two wires. These goods are referred to by the company as of good quality and a desirable addition to their already extensive assortment of domestic and imported goods.

A. Glines & Son, who closed out their business in Rockwell, Iowa, in August last, have since bought out W. A. Knight's business at Belle Plaine, Iowa, and are continuing it under the style of A. E. Glines & Co.

## The Sanitary Ice Cream Disher.

The accompanying cuts represent an ice cream disher worked by one hand, leaving the other hand free to handle plate, glass or dish. The disher can be taken

*Fig. 1.—The Sanitary Ice Cream Disher.*

apart and cleaned thoroughly to prevent it becoming sour or rancid. It is easily taken apart and readjusted. The disher is made both tinned and nickel plated, in nine different sizes. The disher is being put on the market by the Annetta Mfg. Company, Pittsburgh, Pa.,

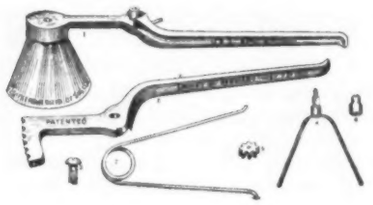


*Fig. 2.—Parts of Ice Cream Disher.*

for whom G. Y. Williams & Co., 406 Bijou Building, Pittsburgh, Pa,. are exclusive selling agents for the United States.

## The Bicycle Garden Plow.

The bicycle plow shown herewith is provided with wheels 18 inches in diameter, having wire spokes and 1 x ⅛ inch steel tires. The side bars are of soft steel and the beam of cast iron. The handles are of selected white oak. The four tools shown in the illustration accompany each plow, which weighs about 20 pounds. The plow can be made to enter the ground from a fraction

*The Bicycle Garden Plow.*

of an inch to 5 inches by loosening the adjusting bolt and setting the plow to the required depth, which, it is explained, can be done in less than a minute. When the plow is set to plow a desired depth it cannot be made to go any deeper, thus insuring uniform cultivation. The handles can be raised to suit the tall man or lowered to fit the small boy. The front wheel is adjustable to give any desired angle to tools. It is claimed that a child ten years old can push the plow with ease, and that more can be accomplished in an hour with the plow than can be done with a hoe in six hours. The plow is offered by the Bicycle Garden Plow Company, Jackson, Ohio.

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# Current Hardware Prices.

REVISED JANUARY 6, 1903.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued April, 1902, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants

### Adjusters' Blind—

Domestic, ₩ doz. $3.00 ..... 33⅓%
North's ..... 10%
Zimmerman's.—See *Fasteners, Blind.*

### Window Stop—

Ives' Patent ..... 25&5%
Taplin's Perfection ..... 25&5%

### Ammunition—See *Caps, Cartridges, Shells, &c.*

### Anvils—American—

Arma and Hammer, Wrought ₩ lb 8¼@8¾¢
Buel and Co., Trenton ..... ₩ lb 7¾@8¢
Eagle Anvils ..... ₩ lb 7¼@7¾¢
Hay-Budden, Wrought ..... 9@9¼¢
Horseshoe brand, Wrought ..... 9@9¼¢

### Imported—

Peter Wright & Sons ..... ₩ lb 10½¢

### Anvil, Vise and Drill—

Millers Falls Co., $18.00 ..... 50&10%

### Apple Parers—See *Parers, Apple, &c.*

### Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. ..... 25%
Smaller Lots ..... 20%
Lots of 3 doz. ..... 30%

### Augers and Bits—

*Com. Double Spur ..... 70&10@75%*
*Boring Machine Augers ..... 70&10@75%*
*Car Bits, 12-in. twist ..... 60@60&10%*
*Jennings' Pattern Auger Bits ..... 50&10&5@60%*
Ford's Auger and Car Bits ..... 40%
Forstner Pat. Auger Bits ..... 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25&10%
No. 30, R. Jennings' List ..... 40&7½&10%
Russell Jennings' ..... 25&10&5%
L'Hommedieu Car Bits ..... 15&10%
Mayhew's Countersink Bits ..... 45%
Millers' Falls ..... 50&10&5%
Pugh's Black ..... 20%
Pugh's Jennings' Pattern ..... 35%
Snell's Auger Bits ..... 60%
Snell's Bell Hangers' Bits ..... 50&10%
Snell's Car Bits, 12-in. twist ..... 60%
Wright's Jennings Bits (R. Jennings' list) ..... 50%

### Bit Stock Drills—

*Standard List ..... 65&5@70%*

### Expansive Bits—

Clark's small, #18; large, $26 ..... 50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18 ..... 50&10%
C. E. Jennings & Co., Steer's Pat. .25&10%
Swan's ..... 60%

### Gimlet Bits—

*Common Double Cut..gro. $2.50@3.00*
*German Pattern ..... gro. $4.00@4.35*

### Hollow Augers—

*Bonney Pattern, per doz. $11.00@11.50*
Ames ..... 25&10%
New Patent ..... 25&10%
Universal ..... 20%
Wood's Universal ..... 25%

### Ship Augers and Bits—

Ford's ..... 40%
Snell's ..... 40%
C. E. Jennings & Co.:
L'Hommedieu's ..... 15&13%
Watrous' ..... 33⅓&10%

### Awl Hafts, See *Hafts, Awl.*

### Awls—

*Brad Awls:*
*Handled ..... gro. $2.75@3.00*
*Unhandled, Shouldered. gro. 63@66c*
*Unhandled, Patent ..... gro. 66@70¢*
*Peg Awls:*
*Unhandled, Patent ..... gro. $1@3¼c*
*Unhandled, Shouldered. gro. 65@70c*
*Scratch Awls:*
*Handled, Common.. gro. $3.50@4.00*
*Handled, Socket.. gro. $11.50@12.00*
Hurwood ..... 40%

### Awl and Tool Sets—See *Sets, Awl and Tool.*

### Axes—

*First Quality, factory brands ... $6.00*
*First Quality, jobbers' brands ... $5.50*
*Second Quality ..... $5.00@5.25*

### Axle Grease—See *Grease, Axle.*

### Axles—Iron or Steel

*Concord, Loose Collar .... 4½@5c*
*Concord, Solid Collar .... 5½@5¾c*
*No. 1 Common ..... 3¾@4 c*
*No. 1 Com. New Style .. 3¾@4 c*
*No. 2 Solid Collar ..... 4¼@4½c*
*Nos. 11 to 14 .... 65&10&5@70&5%*
*Nos. 1 to 18 ..... 75@75&10%*
*Nos. 19 to 22 ..... 75@75&10%*
} Each 10 days.

### Boxes, Axle—

*Common and Concord, not turned .. lb. 4¼@4½c*
*Common and Concord, turned ..... lb. 4¾@5c*
*Half Patent ..... lb. 8@9c*

### Balances—Sash—

Caldwell new list ..... 50%
Pullman's ..... 60%

### Barb Wire—See *Wire, Barb.*

### Bars—Crow—

*Steel Crowbars, 10 to 40 lb., per lb. .. 2¾@3c*

### Towel—

No. 10 Ideal, Nickel Plate ..... ₩ gro. $8.50
No. 20 Ideal, Brass Finish ..... ₩ gro. $8.50

### Baskets—

Hoffman's Brick Baskets ..... each $3.25

### Beams, Scale—

*Scale Beams, List Jan. 12, '85.40&10%*
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

### Beaters—Egg—

National Mfg. Co.: ₩ gro.
No. 1 Dover, Family size ..... $7.00
No. 2 Dover, Hotel size ..... 14.00
Taplin Mfg. Co.: ₩ gro.
No. 60 Improved Dover ..... $6.50
No. 75 Improved Dover ..... 7.50
No. 75-2 Imp'd Dover, Tin'd ..... 8.00
No. 100 Improved Dover ..... 8.00
No. 102 Improved Dover, Tin'd ..... 9.50
No. 150 Improved Dover, Hotel. $15.00
No. 152 Imp'd Dover, Hotel, T'd. $17.00
No. 200 Imp'd Dover Tumbler ..... $9.00
No. 202, Imp'd Dover Tumbler, Tin'd $10.00
No. 900, Imp'd Dover Mammoth, ₩ doz. ..... $27.00
Lyon's, Standard size ..... ₩ doz. $1.75
Wonder (S. S. & Co.) ..... ₩ gro. $6.00

### Bellows—

*Blacksmith, Standard List. 70@70&10%*

### Blacksmiths'—

| Inch.. | 30 | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|
| Each.. | $3.50 | 3.75 | 4.25 | 4.80 | 5.35 | 6.15 |

*Extra Length:*

| Each.. | $4.00 | 4.55 | 5.10 | 5.60 | 6.40 | 7.50 |
|---|---|---|---|---|---|---|

### Molders—

| Inch.. | 9 | 10 | 11 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|
| Doz... | $6.75 | 7.25 | 8.50 | 9.50 | 12.00 | 14.50 |

### Hand—

| Inch... | 7 | 8 | 9 | 10 | 12 |
|---|---|---|---|---|---|
| Doz.... | $4.75 | 5.25 | 5.75 | 6.25 | 7.00 | 8.00 |

} Net Prices.

### Bells—Cow—

*Ordinary goods ..... 75&5@75&10%*
*High grade ..... 70@70&10%*
Jersey ..... 75&10%
Texas Star ..... 50%

### Door—

Abbe's Gong ..... 45%
Barton Gong ..... 55%
Home, R. & E. Mfg. Co.'s ..... 55&10%
Lever and Pull, Sargent's .... 60&10&10%
Yankee Gong ..... 35%

### Hand—

*Hand Bells, Polished.... 60&5@60&10%*
*White Metal ..... 55@55&10%*
*Nickel Plated ..... 50@55&5%*
*Swiss ..... 60@60&5@½%*
Cone's Globe Hand Bells ... 33⅓@33⅓&10%
Silver Chime ..... 33⅓@33⅓&10%

### Miscellaneous—

*Farm Bells ..... lb. 2@2¼c*
*Steel Alloy Church and School ..... 60%*
National Bell Foundry Co.:
Superior Cast Steel Church and School Bells ..... 50&10&5&60%
American Tube & Stamp'g Co. Gongs. 70%
Trip Gong Bells ..... 55&10@60%

### Belting—Rubber—

*Agricultural (Low Grade). 75&10@80%*
*Common Standard ..... 75@75&10%*
*Standard ..... 70@70&10%*
*Extra ..... 60&10&5%*
*High Grade ..... 50&10@50&10&5%*
Boston Belting Co.:
Seamless Stitched Imperial ..... 45&5%
Boston ..... 50&5%
Niagara ..... 60&5%

### Leather—

*Extra Heavy, Short Lap .... 60@60&5%*
*Regular Short Lap 60&10@60&10&10%*
*Standard ..... 70@70&5%*
*Light Standard ..... 70&10%*
*Cut Leather Lacing ..... 60&10%*
*Leather Lacing Sides, per sq. ft. .18c*

### Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand ..... 60&10%
Durable Brand ..... 70%

### Bench Stops—See *Stops, Bench*

### Benders and Upsetters, Tire—

Detroit Perfected Tire Bender ..... 40%
Green River Tire Benders and Upsetters ..... 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $3.75; No. 2, $6.50; No. 3, $9.50; No. 4, $14.75. No. 5, $18.75.

### Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain ..... 50%
Parts ..... 50%
Spokes ..... 50%
Tubes ..... 60%

### Bits—

Auger, Gimlet, Bit Stock Drills, &c.—*See Augers and Bits.*

### Bit Holders—See *Holders.*

### Blind Adjusters—See *Adjusters, Blind.*

### Blind Fasteners—See *Fasteners, Blind.*

### Blind Staples—See *Staples, Blind.*

### Blocks—Tackle—

*Common Wooden ..... 70&10@75%*
Cleveland Steel ..... 60@60&10%
Hollow Steel Blocks, with Ford's Patent Sheaves ..... 50&10%
Lane's Patent Automatic Lock and Junior ..... 30%
Stowell's Novelty, Mal. Iron ..... 50&10%
See also *Machines, Hoisting.*

### Boards Stove—

*Zinc, Crystal, &c. ..... 40&10@50%*

### Bolts—Carriage, Machine &c.—

*Common, list Feb. 1, '02. ....60&5@..%*
*Norway Iron. $3.00, list Jan. 1. '98 80@80&5%*
*Phila. Eagle, $3.00 list May 24, '99.... 80@80&5%*
*Bolt Ends. list Feb. 14, '95. 65&2½@..%*
*Machine, list Oct. 1, '99 ..... 65@..%*
*Machine with C & T. Nuts ..... 60&2½@..%*

NOTE.—*Jobbers are in many cases underselling the manufacturers.*

### Door and Shutter—

*Cast Iron Barrel, Round Brass Knob:*

| Inch..... | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| Per doz... | $0.26 | .30 | .39 | .47 | .65 |

*Cast Iron Spring Foot:*

| Inch ..... | 6 | 8 | 10 |
|---|---|---|---|
| Per doz..... | $1.00 | 1.35 | 1.75 |

*Cast Iron Chain, Flat, Japanned:*

| Inch ..... | 6 | 8 | 10 |
|---|---|---|---|
| Per doz ..... | $0.75 | 1.05 | 1.30 |

*Cast Iron Shutter, Brass Knobs:*

| Inch ..... | 6 | 8 | 10 |
|---|---|---|---|
| Per doz..... | $0.87 | .80 | 1.00 |

*Wrought Barrel Brass Knob:*

| Inch.... | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| Per doz | $0.44 | .50 | .61 | .70 | 1.28 |

*Wrought Barrel ..75&10@75&10@10%*
*Wrought " Bronzed. 40&5@50&10%*
*Wrought Flush, B. K. .50&10@60&10%*
*Wrought Shutter ..40@10@10@60&5%*
*Wrought Square Neck ..... 50@50&10%*
*Wrought Sunk ..... 60@50&10%*
Ives' Patent Door ..... 60%

### Stove and Plow—

*Plow ..... 60@..%*
*Stove ..... 77½@77½&10%*

### Tire—

*Common ..... 77½%*
*Norway Iron ..... 80@80&5%*
American Screw Company:
Norway Phila., list Oct. 16, '84.... 82½%
Eagle Phila., list Oct. 16, '84..... 85%
Bay State, list Dec. 28, '99 ..... 77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.. 82½%
Eagle Phila., list Oct. 16, '84..... 85%
Eclipse, list Dec. 28, '99 ..... 77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99 ..... 77½%
Keystone Phila. list Oct. '84..... 85%
Norway Phila., list Oct. '84..... 82½%
Upson Nut Co.:
Tire Bolts ..... 77½%

### Borers, Tap—

*Borers Tap, Ring, with Handle:*

| Inch..... | 1/4 | 1/2 | 1/4 | 2 |
|---|---|---|---|---|
| Per doz.. | $4.30 | 5.00 | 5.75 | 7.25 |
| Inch ..... | 2¼ | 2½ | | |
| Per Doz..... | $8.65 | 11.50 | | |

Enterprise Mfg. Co., No. 1, $1.35; No. 2, $1.65; No. 3, $2.50 each ..... 25%

### Boring Machines—*See Machines, Boring.*

### Boxes, Mitre—

C. E. Jennings & Co. ..... 25&10%
Langdon ..... 15&10%
Schatz ..... 40%
Seavey's, per doz., $30 ..... 40%

### Braces—

NOTE.—*Most Braces are sold at net prices.*
*Common Ball, American..$1.15@1.25*
Barber's ..... 50&10&10@50&10%
Fray's Genuine Spofford s ..... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5&10%
Mayhew's Ratchet ..... 60%
Mayhew's Quick Action Hay Patent..50%
Millers Falls Drill Braces ..... 25&10%
P. S. & W. Co. Peck's Patent 60&10@65%

### Brackets—

*Wrought Steel ..... 75&10@80%*
Bradley's Wire Shelf:
Full cases ..... 80&10&10%
Broken cases ..... 80&10%
Griffin's Pressed Steel ..... 80%
Griffin's Folding Brackets ..... 70&10%

### Bright Wire Goods—See *Wire and Wire Goods.*

### Broilers—

Wire Goods Co. ..... 75@75&10%

### Buckets, Well and Fire—See *Pails*

### Bucks, Saw—

Hoosier ..... ₩ gro. $36.00

### Bull Rings—See *Rings, Bull.*

### Butts—Brass—

*Wrought list Sept., '96.... 30@30&5%*
Cast Brass, Tiebout's ..... 50%

### Cast Iron—

*Fast Joint, Broad ..... 50@50&10%*
*Fast Joint, Narrow.. ..... 50@50&10%*
*Loose Joint ..... 70&5@70&10%*
*Loose Pin ..... 70&5@70&10%*
*Mayer's Hinges ..... 70&5@70&10%*
*Parliament Butts ..... 70&5@70&10%*

### Wrought Steel—

*Table and Back Flaps ..... 60%*
*Narrow and Broad ..... 50%*
*Inside Blind ..... 66&10%*
*Loose Pin ..... 60&10%*
*Loose Pin, Ball and Steeple Tip ..... 75%*
*Japanned, Ball Tip Butts.. 60%*
*Bronzed Wrt. Nar. and Inside Blind Butts ..... 45&20@45&25%*

} Extra 25&10@50&10&5%

### Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series ..... 5%
1200 series ..... 33⅓%
200, 300, 600 and 900 series ..... 40&10%
Hendryx Bronze:
700, 800 series ..... 40&10%
Hendryx Enameled ..... 40&10%

### Calipers—See *Compasses.*

### Calks, Toe and Heel—

*Blunt, 1 prong ..... per lb. 4@4¼c*
*Sharp, 1 prong ..... per lb. 4¼@4½c*
Perkins' Blunt Toe ..... ₩ lb 3½¢
Perkins' Sharp Toe ..... ₩ lb 4 ¢

### Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons ..... per doz $2.00

### Can Openers—See *Openers, Can*

### Cans, Milk—

| | 5 | 8 | 10 gal. | |
|---|---|---|---|---|
| Illinois Pattern. | $1.50 | 2.00 | 2.25 | each. |
| Iowa Pattern... | .... | 2.35 | 2.50 | each. |
| | 20 | 30 | 40 | qts. |
| New York Patt'rn | 1.65 | 2.40 | 2.75 | each. |
| Baltimore Patt'rn | .... | 1.80 | 2.00 | each. |

### Cans, Oil—

Buffalo Family Oil Cans:

| 3 | 5 | 10 gal. |
|---|---|---|
| $48.00 | 60.00 | 120.00 gro |

### Caps—Percussion—

*Eley's E. B. ..... 60c*
*G. D ..... per M 32@34c*
*F. L ..... per M 42@..c*
*G. E ..... per M 47@50c*
*Musket ..... per M 62@..c*

### Primers—

*Berdan Primers, $1.00 per M ..... 5%*
*B. L. Caps (Sturtevant Shells) $1.00 per M ..... 5%*
*All other primers per M. $1.22 @$1.27*

### Carpet Stretchers—
See *Stretchers, Carpet.*

### Cartridges—
*Blank Car tridges:*
*32 C. F., $5.50* ..... 10@5%
*38 C. F., $7.0* ..... 10@5%
*22 cal. Rim, $1.50* ..... 10@5%
*32 cal. Rim, $2.75* ..... 10&5%
B. B. Caps, Con., Ball Swgd ..... $1.90
B. B. Caps, Round Ball ..... $1.40
*Central Fire* ..... 25%
*Target and Sporting Rifle* ..... 15@5%
*Primed Shells and Bullets* ..... 15@10%
*Rim Fire Sporting* ..... 50%
*Rim Fire, Military* ..... 15&5%

### Casters—
*Bed* ..... 70@70&10%
*Plate* ..... 60@60&5%
*Philadelphia* ..... 75@75&10%
Boss ..... 70&10%
Boss Anti-Friction ..... 70&10%
Martin's Patent (Phœnix) ..... 45%
Payson's Anti-Friction ..... 70&10&10%
Standard Ball Bearing ..... 45%
Tucker's Patent low list ..... 80%

### Cattle Leaders—
See *Leaders, Cattle.*

### Chain, Coil—
*American Coil, Jobbers' Shipments:*

| | | | | | |
|---|---|---|---|---|---|
| *3-16* | *¼* | *5-16* | *⅜* | *7-16* | *½* | *9-16* |
| *8.70* | *6.35* | *5.10* | *4.20* | *4.00* | *3.90* | *3.85* |
| *⅝* | *¾* | *⅞* | *1 to 1¼ inch.* | | | |
| *3.80* | *3.75* | *3.70* | *3.60* | *per 100 lb.* | | |

*German Coil* ..... 60&10@60&10@10%

### Halters and Ties—
*Halter Chains* ..... 60@10@60@10@10%
*German Halter Chain, list July 24, '97* ..... 60&10@60&10@10@5%
*Cow Ties* ..... 50@10@60%

### Trace, Wagon, &c.—
*Traces, Western Standard: 100 pair*
*6½—6-3, Straight, with ring* ..... $30.00
*6½—6-2, Straight, with ring* ..... $31.00
*6½—8-2, Straight, with ring* ..... $34.00
*6½—10-2, Straight, with ring* ..... $39.00
*Add 2¢ per pair for Hooks.*
*Twist Traces 2¢ per pair higher than Straight Link.*
*Trace, Wagon and Fancy Chains* ..... 50@10@50@10@10%

### Miscellaneous—
*Jack Chain, list July 10, '02:*
*Iron* ..... 60@10@60@10@10%
*Brass* ..... 60@10@60@10@10%
*Safety Chain* ..... 70@10@75@5%
*Gal. Pump Chain* ..... lb. 4@4½@
Covert Mfg. Co.
Breast ..... 35&2%
Halter ..... 35&2%
Heel ..... 35&2%
Rein ..... 35&2%
Stallion ..... 35&2%
Covert Sad. Works:
Breast ..... 70%
Halter ..... 70%
Hold Back ..... 70%
Rein ..... 70%
Oneida Community:
Am. Coil and Halters ..... 40@45&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50&5%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%
Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 70&10%
Universal Dbl-Jointed Chain ..... 50%

### Chalk—(From Jobbers.)
*Carpenters' Blue* ..... gro. 40@45c
*Carpenters', Red* ..... gro. 35@40c
*Carpenters', White* ..... gro. 30@35c
*See also Crayons.*

### Chalk Lines—See *Lines.*

### Checks, Door—
Bardsley's ..... 40&10%
Columbia ..... 50&10%
Eclipse ..... 60%

### Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools ..... 55%
Youths' Chests, with Tools ..... 40%
Gentlemens' Chests, with Tools ..... 30%
Farmers', Carpenters', Chests, with Tools ..... 30%
Machinists' and Pipe Fitters' Chests, Empty ..... 30%
C. E. Jennings & Co.'s Machine Chests ..... 30%

### Chisels—

### Socket Framing and Firmer
*Standard List* ..... 70@70&10%
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's ..... 70%
L. & I. J. White ..... 30@30&5%

### Tanged—
*Tanged Firmers* ..... 40@5@40&10%
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Nos. 191, 181 ..... 16⅔&10%
L. & I. J. White, Tanged ..... 25&5%

### Cold—
*Cold Chisels, good quality* ..... lb. 13@15c
*Cold Chisels, fair quality* ..... lb. 11@12c
*Cold Chisels, ordinary* ..... lb. 8@9c

### Chucks—
Beach Pat., each $8.00 ..... 35&5%
Massey's Planer and Milling ..... 15@20%
Pratt's Positive Drive ..... 25%
Empire ..... 25%
Blacksmiths' ..... 25%
Skinner Patent Chucks:
Combination Lathe Chucks ..... 40%
Drill Chucks, Patent and Standard ..... 30%
Drill Chucks, New Model ..... 25%
Independent Lathe Chucks ..... 40%
Improved Planer Chucks ..... 25%
Universal Lathe Chucks ..... 40%
Face Plate Jaws ..... 40%
Standard Tool Co.:
Improved Drill Chuck ..... 45%
Union Mfg. Co.:
Combination ..... 40%
Car Drill ..... 30%
Geared Scroll ..... 30%
Independent ..... 40%
Union Drill ..... 30%
Universal ..... 40%
Face Plate Jaws ..... 35%
Wescott Patent Chucks:
Lathe Chucks ..... 50%
Little Giant Auxiliary Drill ..... 40%
Little Giant Double Grip Drill ..... 40%
Little Giant Drill, Improved ..... 40%
Oneida Drill ..... 40%
Scroll Combination Lathe ..... 40%

### Clamps—
Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. ..... 50%
Carriage Makers' Sargent's ..... 60%
Besly, Parallel ..... 33⅓&10%
Linemans, Utica Drop Forge & Tool Co ..... 40%
Saw Clamps, see *Vises, Saw Filers'.*

### Cleaners Sidewalk—
Star Socket, All Steel ..... ₱ doz. $4.05 net
Star Shank, All Steel ..... ₱ doz. $3.24 net
W. & C. Shank, All steel, 7¾ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

### Cleavers, Butchers'—
Foster Bros. ..... 30%
New Haven Edge Tool Co.'s ..... 45%
Fayette R. Plumb ..... 33⅓@33⅓&10%
P., S & W ..... 50@50&5%
L. & I. J. White ..... 25%

### Clippers—
Chicago Flexible Shaft Company
'98 Chicago Horse ..... $8.75
1902 Chicago Horse ..... $10.75
Lightning Belt ..... $15.00
Chicago Belt ..... $20.00
Stewart's Patent Sheep ..... $18.50
(15%)

### Clips, Axle—
*Eagle and Superior ¼ and 5-16 inch* ..... 70@10%
*Norway, ⅛ and 5-16 inch* ..... 70@70@10%

### Cloth and Netting, Wire
—See *Wire, &c.*

### Cocks, Brass—
*Hardware list:*
*Compression and Plain Bibbs* ..... 65@5@65@10%
*Globe, Kerosene, Racking, &c., Cocks* ..... 65@10@70%

### Coffee Mills—See *Mills, Coffee.*

### Collars Dog—
Brass, Walter B. Stevens & Son's list ..... 40%
Embossed, Gilt, Walter B. Stevens & Son's list ..... 30&10%
Leather, Walter B. Stevens & Son's list ..... 40%

### Combs Mane and Tail—
Covert's Saddlery Works ..... 60&10%

### Compasses Dividers, &c.
*Ordinary Goods* ..... 75@75@5%
Bemis & Call Hdw. & Tool Co.:
Dividers ..... 65%
Calipers, Call's Patent Inside ..... 55%
Calipers, Double ..... 65%
Calipers, Inside or Outside ..... 65%
Calipers, Wing ..... 60%
Compasses ..... 50%
J. Stevens A. & T. Co. ..... 25&10%

### Compressors Corn Shock—
J. B. Hughes' ₱ doz. ..... $2.50

### Conductor Pipe, Galva.—
*L. C. L. to Dealers:*

| *Territory.* | *Not nested.* | *Nested.* |
|---|---|---|
| *Eastern* | *75@7½%* | *75@2½%* |
| *Central* | *75@2½%* | *70@2½%* |
| *Southern* | *70@7½%* | *70@2½%* |
| *S. Western* | *65@10@10%* | *65@10@5%* |

*Terms, 2% for cash. With delivery on flat cars.*
*Jobbers sometimes cut above prices.*
See also *Eave Troughs.*

### Coolers, Water—

| Gal. each | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Labrador ₱ doz. | $1.20 | $1.80 | $2.10 | 2.70 |
| Gal. | 3 | 4 | 6 | 8 |
| Iceland, ea. | $1.80 | 2.0 | $2.40 | $3.00 |
| Gal. | 2 | 3 | 4 | 6 | 8 |
| Galv. Lined Ea. | $1.35 | 1.90 | $2.25 | $2.90 | $3.90 |

25%

Galv. Lined side han.

| Gal. | 3 | 4 | 6 | 8 |
|---|---|---|---|---|
| Each | $1.95 | $2.15 | $2.3 | $3.30 | $4.15..25% |

### Coopers' Tools—
See *Tools, Coopers'.*

### Cord— Sash—
*Braided, Drab* ..... lb. 25c
*Braided, White, Com* ..... lb. 17½@18c
*Cable Laid Italian* ..... lb. A, 18c; B, 16c
*Common India* ..... lb 9 @9½c
*Cotton Sash Cord, Twisted* ..... 12@16c
*Patent Russia* ..... lb. 12½@13c
*Cable Laid Russia* ..... lb. 13½@14c
*India Hemp, Braided* ..... lb 14@15c
*India Hemp, Twisted* ..... lb. 10@12c
*Patent India, Twisted* ..... lb. 10@12c
Pearl Braided, cotton ..... ₱ lb 17½c
Massachusetts, White ..... ₱ lb 22½c
Massachusetts, Drab ..... ₱ lb 26½c
Eddystone Braided Cotton ..... ₱ lb 19c
Harmony Cable Laid Italian ..... ₱ lb 18c
Oswayan Mills:
Crown, Solid Braided White ..... ₱ lb 22c
Braided, Giant, White ..... ₱ lb 20c
Peerless:
Cable Laid Italian ..... 16c
Cable Laid Russian ..... 14c
Cable Laid India ..... 12c
Braided India ..... 18c
Phœnix, White ..... 19c
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ₱ lb 32½c
Braided, Italian Hemp ..... ₱ lb 32½c
Braided, Linen ..... ₱ lb 49c
Braided, White Cotton, Spot ..... ₱ lb 28½c
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ ..... 15%
A quality, White, 35¢ ..... 15%
B quality, Drab, 35¢ ..... 15%
B quality, White, 30¢ ..... 15%
Italian Hemp, 40¢ ..... 15%
Linen, 57½¢ ..... 15%

### Wire, Picture—
*List Oct., '00, 85¢ 10¢ 10@85¢ 10¢ 10¢ 10%*

### Corn Knives and Cutters
—See *Knives, Corn.*

### Corn Planters—
See *Planters, Corn—*

### Crackers, Nut—
Little Giant ..... ₱ gr. $24.00

### Cradles—
*Grain* ..... 50%

### Crayons—
*White Round Crayons, gross, 5½@6c*
*Cases, 100 gro., $4.50, at factory.*
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

### Creamery Pails—See *Pails, Creamery.*

### Crooks, Shepherds'—
Fort Madison, Heavy ..... ₱ doz. $7.00
Fort Madison, Light ..... ₱ doz. $6.50

### Crow Bars—See *Bars, Crow.*

### Cultivators—
Victor Garden ..... 50%

### Cutlery Table—
International Silver Company:
No. 12 Medium Knives, 1847 ..... ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz. $3.00
Wm. Rogers & Son ..... ₱ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives ..... ₱ doz. $3.00
No. 77 Medium Knives ..... ₱ doz. $2.50

### Cutters— Glass—
H. H. Mayhew Co ..... 40%
Red Devil ..... 50%
Smith & Hemenway Co ..... 70%
Woodward ..... 40%

### Meat and Food—
*Hale's..Nos. 11 & 111 12 & 112 13 & 113*
*Per doz .. $8.00 10.75 14.50*
American ..... 30%

| Nos. | 1 | 2 | 3 | 4 | B | 5 |
|---|---|---|---|---|---|---|
| Each | $5 | $7 | $10 | $25 | $50 | $60 |

Connecticut ..... 50%

| Nos. | 20 | 40 | 60 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|
| Each | $1.75 | 2.00 | 2.75 | 3.00 | 3.00 | 4.00 |

Enterprise ..... 25@25&7½%

| Nos. | 10 | 12 | 22 | 32 |
|---|---|---|---|---|
| Each | $2 | $3 | $2.50 | $4 | $6 |

Dixon's, ₱ doz. ..... 30&10@40%

| Nos. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $14.00 | $17.00 | $19.00 | $30.00 |

Home No. 1, ₱ doz. $22.75 ..... 50&10%
Little Giant, ₱ doz. ..... 33⅓&5@40%

| Nos. | 305 | 310 | 312 | 320 | 322 |
|---|---|---|---|---|---|
| | $35.00 | $48.00 | $44.00 | $72.00 | $68.00 |

N. E. Food Choppers ..... 40%
Sterling ..... 40@40&1 %
No. 1 ..$2.00 each No. 2 ..$2.50 each
New Triumph No. 605, ₱ doz. $24.00 .. 30&10@40%
Woodruff's, ₱ doz ..... 30&10@40%

| Nos. | 100 | 150 |
|---|---|---|
| | $15.00 | $18.00 |

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers ..... 25@30%

### Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c ..... 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9 ..... 55%
Kraut Cutters 36 x 12, 40 x 12 ..... 40%
Sterling, $6.00 each ..... 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters ..... 40%
Slaw Cutters, 1 Knife, ₱ gr. ..... $18@$20
Slaw Cutters, 2 Knife, ₱ gr. ..... $22@$36

### Tobacco—
*All Iron, Cheap* ..... doz. $4.25@$4.50
Enterprise ..... 25&20%
National, ₱ doz. No. 1, $21; No. 2, $18. 40%
Sargent's, ₱ doz., No. 2 ..... 60%
Sargent's No. 2 and 2½ ..... 60&10%

### Washer—
Appleton's, ₱ doz. $16.00 ..... 50&10%
Bonney's ..... 40%

### Diggers, Post Hole, &c.—
Dalbey Post Hole Auger ..... per doz. $9.00
Iwan's Improved Post Hole Auger ..... 40&5%
Iwan's Perfection Post Hole Digger ..... doz. $8.50
Kohler's Universal ..... ₱ doz. $15.00
Kohler's Little Giant ..... ₱ doz. $14.00
Kohler's Hercules ..... ₱ doz. $12.00
Kohler's Invincible ..... ₱ doz. $10.00
Kohler's Rival ..... ₱ doz. $9.00
Kohler's Pioneer ..... ₱ doz. $9.00
Never-Break Post Hole Diggers, ₱ doz. $24.00 ..... 60%
Samson, ₱ doz. $34.00 ..... 25%

### Dividers—See *Compasses.*

### Dog Collars—See *Collars, Dog.*

### Door Checks—See *Checks, Door.*

### Door Springs—See *Springs, Dr.*

### Doors Screen—
Porter's Plain, No. 6 ..... ₱ doz. $6.50
Porter's Ornamental, No. 70 ..... ₱ doz. $10.00

### Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

### Drawing Knives—
See *Knives, Drawing.*

### Drills and Drill Stocks—
*Common Blacksmiths' Drill..each $1.50@$1.75*
*Blacksmiths' Self-feeding, $3.75@4.00*
Breast, Millers Falls ..... 10&10%
Breast, P., S. & W ..... 40&5%
Goodell Automatic Drills ..... 40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16⅔&10%
Johnson's Drill Points ..... 16⅔&5&10%
Millers Falls Automatic Drills ..... 33⅓&10%
Ratchet, Curtis & Curtis ..... 25%
Ratchet, Parker's ..... 40%
Ratchet, Weston's ..... 33⅓%
Ratchet, Whitney's, P. S. & W ..... 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓%

### Twist Drills—
*Standard List* ..... 60¢ 10@60¢ 10¢ 10%

### Drill Bits or Bit Stock Drills—See *Augers and Bits.*

### Drivers Screw—
*Screw Driver Bits, per doz. ..45@75c*
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9. 40%
Buck Bros. ..... 30%
Buck Bros' Screw Driver Bits ..... 30%
Champion ..... 50%
Edson ..... 60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet ..... 33%
Goodell's Auto 50&10&10@50&10&10&5%
Hurwood ..... 40%
Mayhew's Black Handle ..... 50%
Mayhew's Monarch ..... 40&10%
Millers Falls, Nos. 20 and 21 ..... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ..... 15&10%
Never Turn ..... 60%
New England Specialty Co. ..... 50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 60%
Nos. 20 and 40 ..... 70%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles ..... 30@60&10&10%
No. 86 ..... 70@70&10&10%
Swan's:
Nos. 65 to 68 ..... 5%
Nos. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

### Eave Trough Galvanized

| *Territory.* | *L. C. L.* |
|---|---|
| *Eastern* | *80@7½%* |
| *Central* | *80@2½%* |
| *Southern* | *75@10@2½%* |
| *S. Western* | *75@10@2½%* |

*Terms, 2% for cash.*
*Prices sometimes cut by jobbers.*
See also *Conductor Pipe and Elbows.*

### Elbows and Shoes—
*Factory shipments* ..... 60%
Perfect Elbows (S., S. & Co.) ..... 80%

### Emery, Turkish—

| | *4 to 5* | *5½ to 15* | *Flour* |
|---|---|---|---|
| *Kegs* ..... lb. | *5c* | *5½c* | *8½c* |
| *Kegs* ..... lb | *7c* | *6c* | |
| *10-lb cans, 10 in case* | *6½c* | *7c* | *6c* |
| *10-lb. cans, less than* | *10.10c* | *10c* | *8c* |

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

### Enameled and Tinned Ware—See *Ware, Hollow.*

### Escutcheon Pins—
See *Pins, Escutcheon.*

### Extractors, Lemon Juice
—See *Squeezers, Lemon.*

### Fasteners, Blind—
Zimmerman's ..... 50&10%
Walling's ..... 50%

### Faucets—
*Cork Lined* ..... 50@50&10%
*Metallic Key, Leather Lined* ..... 70@70&10%
*Red Cedar* ..... 40@10@50%
B. & L. B. Co.:
et 1 Key ..... 60&10%
Star ..... 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key ..... 40%
John Sommer's Boss Tin Key ..... 50%
John Sommer's Victor Metal Key ..... 50&10%
John Sommer's Duplex Metal Key ..... 60%
John Sommer's Diamond Lock ..... 40%
John Sommer's L. X. L. Cork Lined ..... 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined ..... 60%
John Sommer's O. K. Cork Lined ..... 50%
John Sommer's No Brand, Cedar ..... 50%
John Sommer's Perfection Cedar ..... 40%
McKenna, Brass:
Burglar Proof, N. P ..... 35%
Improved, ¾ and ⅞ inch ..... 35%
Self Measuring:
Enterprise, ₱ doz. $30.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36 ..... 40&10%

### Felloe Plates—
See *Plates, Felloe.*

### Files—Domestic—
*List revised Nov. 1, 1899.*
*Best Brands* ..... 70@5@70@10%
*Standard Brands* ..... 75@75@10@5%
*Second Quality* ..... 75@10@10@80@5%

### Imported—
*Stubs' Tapers, Stubs' list, July 24, '97* ..... 90%

### Fixtures, Grindstone—
*Net Prices:*

| *Inch* | *15* | *17* | *19* | *'21* | *24* |
|---|---|---|---|---|---|
| *Per doz.* | *$2.60* | *2.75* | *3.00* | *3.50* | *4.40* |

P., S. & W. Co. ..... 30&10@40%
Reading Hardware Co ..... 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger ..... ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light ..... 60&10%

### Fodder Squeezers—
See *Compressors.*

### Forks—*Aug. 1, 1899, list.*
*Hay, 2 tine* ..... 60%
*Hay 3 tine* ..... 60@⅓%
*Hay, 4 tine* ..... 60%
*Hay, Header and Baler 3 tine* ..... 6 @15%
*Hay, Header and Baler, 4 tine* ..... 66⅔%
*Grain or Barley* ..... 70%
*Manure, 4 tine* ..... 60@20%
*Manure, 5 and 6 tine* ..... 60@20%
*Spading* ..... 70@5%
Extra 20%
Iowa Dig-Easy Potato ..... 65%
Victor, Hay ..... 66⅔%
Victor, Manure ..... 66⅔%
Victor, Header ..... 66⅔%
Champion, Hay ..... 66⅔%
Champion, Manure ..... 60@20%
Columbia, Hay ..... 60%&5%
Columbia, Manure ..... 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger ..... 65%
Acme Hay ..... 60&10@7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 60%&10&2½%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header ..... 60%&5%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

### Frames— Saw—
*Red, Polished and Varnished* ..... doz. $1.15@$1.35
*White* ..... doz. 75@80c

### Screens and Frames—
See *Screens.*

### Freezers Ice Cream—

| *Qts...* | *2* | *3* | *4* | *6* | *8* | *10* |
|---|---|---|---|---|---|---|
| *Best* | *$1.45* | *1.65* | *1.95* | *2.40* | *3.20* | *4.20* |
| *Good* | *$1.25* | *1.40* | *1.70* | *2.15* | *2.75* | *3.75* |
| *Fair* | *$1.00* | *1.10* | *1.30* | *1.75* | *2.30* | *2.99* |

### Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

### Fry Pans—See *Pans, Fry.*

### Fuse—
*Per 1000 Feet.*
*Hemp Fuse* ..... $2.60
*Cotton Fuse* ..... 2.90
*Single Taped Fuse* ..... 3.25
*Double Taped Fuse* ..... 4.20
*Triple Taped Fuse* ..... 5.00
25%-100%

## Gates, Molasses and Oil—

Stebbins'.....80@80&5%

### Gauges—

*Marking, Mortise, &c.*.....
55&10@55&10&10%
Chapin-Stephens Co., Gauges.....
5 &10@50&10&10%
Fulton's Butt Gauge.....30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....30&10%

### Cimlets— Single Cut—

*Nail, Metal, Assorted.gro. $1.40@1.60*
*Spike, Metal, Assorted.gro. $2.80@3.25*
*Nail, Wood Handled, Assorted.*
*gro. $1.75@2.00*
*Spike, Wood Handled, Assorted*
*gro. $3.25@3.50*

### Glass, American Window

*Jobbers' List, Dec. 16, 1902.*
*From store. Single and Double.90&10%*
*F. O. B. factory, carload lots:*
*Single and Double.....90&20&2½%*
*2000 box lots.....90&25%*

### Glasses Level—

Chapin-Stephens Co.....60@60&10&10%

### Glue—Liquid, Fish—

*List A, Bottles or Cans, with Brush.*
*37½@50%*
*List B, Cans (½ pts., pts., qts).33⅓@48%*
*List C, Cans (½ gal., gal.).....25@45%*
International Glue Co. (Martin's).....
4&10&25%

### Grease, Axle—

*Common Grade.....gro. $5.00@6.00*
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00

Snow Flake:
1 qt. cans, per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%

### Griddles, Soapstone—

Pike Mfg. Co.....33⅓&33⅓&10%

### Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, 1 inch, per doz.....$2.00 } 33⅓%
Pike Mower Knife and Tool Grinder, each.....$6.00 }
Velox Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

### Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000.....$9.00
Copper ₱ 1000.....$18.00

## Halters and Ties—

Covert Mfg. Co.:
Web.....45&2%
Jute Rope.....45&2%
Sisal Rope.....30&2%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties.....60&10%

### Hammers—Handled Hammers—

Heller's Machinists'..40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&10&10%
Peck, Stow & Wilcox.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.33⅓&7½@33⅓&10 &7½%
Engineers' and B. S. Hand.....
50&7½&5@50&10&7½&5%
Machinists' Hammers50&5@50&10&5%
Riveting and Tinners'.....
40&2½@40&10&2½%
Sargent's C. S. New List.....40%

### Heavy Hammers and Sledges—

*3 lb. and under...lb. 45c } 75&5@75*
*3 to 5 lb.....lb. 36c } &10%*
*Over 5 lb.....lb. 30c }*
*Wilkinson's Smiths'.....9½@10c lb.*

### Handles—Agricultural Tool Handles—

*Axe, Pick, &c.....50@50&10&5%*
*Hoe, Rake, &c.....60@60&5%*
*Fork, Shovel, Spade, &c.:*
*Long Handles.....60%*
*D Handles.....50%*

### Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston'.....50%

### Mechanics' Tool Handles—

*Auger, assorted.....gro. $2.30@2.50*
*Brad Awl.....gro. $1.25@$1.50*
*Chisel Handles:*
*Apple Tanged Firmer, gro. ass'd, $2.25@$2.35; large, $2.50@$2.60.*
*Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; large, $3.50@$3.70.*
*Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25*
*Hickory Socket Firmer, gro. ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00*
*Hickory Socket Framing,gro.ass'd. $2.50@$2.75; large, $2.65@$2.85*
*File, assorted.....gro. $1.00@$1.15*
*Hammer, Hatchet, Axe, &c.....50%*
*Hand Saw, Varnished, doz. 70@75c*
*Not Varnished.....55@60c*
*Plane Handles:*
*Jack, doz.25c; Jack Bolted..55@60c*
*Fore, doz.35@38c; Fore, Bolted..*
*70@75c*
Chapin-Stephens Co.:
Carving Tool.....40@40&10&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw.....40@40&10&10%
Screw Driver.....40@40&10&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₱ gro.....$0.85@$1.50

### Hangers—

*Barn Door, New Pattern, Round Groove, Regular:*

| *Inch* | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| *Single Doz.* | $0.85 | 1.20 | 1.50 | 1.90 | 2.30 |

*Barn Door, New England Pattern, Check Back, Regular:*

| *Inch* | 3 | 4 | 5 | 6 |
|---|---|---|---|---|
| *Single Doz.* | $1.10 | 1.60 | 2.15 | 2.70 |

Allith Mfg. Co.
Reliable.....per doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$2.85
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&10%
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50%
Monarch Barn Door.....60%
Never Jump Hinge.....50%
Peerless.....60%
Perfection.....60&10%
Phoenix.....60&10%
Wagner's Adjustable.....60&10%
Warehouse Anti-Friction.....60%
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing.....40%
Atlas.....60%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....40%
Lundy Parlor Door.....50%
Magic.....50%
Matchless.....60%
Nansen.....60&10%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....40&15%
Stowell Parlor Door.....50%
Wild West, Nos. 300, 404, 500.....50%
Zenith for Wood Track.....50%
A. L. Swett Iron Works:
Eagle.....60&10%
Hylo.....50&10%
Perfection.....60%
Pilot.....60%
Taylor & Boggis Fy Co.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Roller Bearing.....50%
Dwight Roller Bearing.....40%
Ives Steel Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing.....40%
Velvet.....50%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123.....40%
Wilcox Elevator Door Hangers, Nos 112 and 122½.....50%
Wilcox Elevator Door Hangers, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing...40%
Wilcox Wideman Narrow Gauge. Ball Bearing.....40%

For Track, see *Rail.*

### Hasps—

McKinney's Perfect Hasp ₱ doz.....50%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

### Hatchets—

*Best Brands.....50@50&10%*
*Cheaper Brands.....60@60&10%*
*Note.—Net prices often made.*

### Hinges—Blind and Shutter Hinges—

*Surface Gravity Locking Blind:*
*(Victor; National; 1868 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)*

| *No.* | 1 | 3 | 5 |
|---|---|---|---|
| *Doz. pair.* | $0.85 | 1.75 | 3.50 |

*Mortise Shutter:*
*(L. & P., O. S., Dixie, &c.)*

| *No.* | 1 | 1½ | 2 | 2½ |
|---|---|---|---|---|
| *Doz. pair.* | $0.70 | .65 | .60 | .55 |

*Mortise Reversible Shutter, (Buffalo, &c.)*

| *No.* | 1 | 1½ | 2 |
|---|---|---|---|
| *Doz. pair.* | $0.75 | .70 | .65 |

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70&75%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13.....
70&10&70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80 with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....45%
Stenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55.....70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
1908, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3& 5.....5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 1..75%
Pioneer, Nos. 160, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

### Gate Hinges—

*Clark's or Shepard's—Doz. sets:*

| *No.* | 1 | 2 | 3 |
|---|---|---|---|
| *Hinges with Latches.* | $2.00 | 2.70 | 5.00 |
| *Hinges only.* | $1.40 | 2.05 | 3.80 |
| *Latches only.* | .70 | .70 | .35 |

*New England:*
*With Latch.....doz. ....@$2.50*
*Without Latch.....doz. ....@$1.80*
*Reversible Self-Closing:*
*With Latch.....doz. ....@$1.80*
*Without Latch.....doz. ....@$1.45*
*Western:*
*With Latch.....doz. $1.80*
*Without Latch.....doz. $1.20*
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

| No. | 1 | 2 | 3 |
|---|---|---|---|
| Hinges with Latches. | $2.00 | 2.70 | 5.00 |
| Hinges only. | 1.40 | 2.05 | 3.80 |
| Latches only. | .70 | .70 | 1.35 |

### Spring Hinges—

*Holdback, Cast Iron, gro. $9.50@10.00*
*Non-Holdback, Cast Iron gro $7@7.50*
J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....45%
Garden City Engine House.....25%
Keene's Saloon Door.....25%
Columbian Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20&5%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Hoffman Hinge & Foundry Co.:
No. 70 & 81 Holdback Detachable $8.50
Lawson Mfg. Co.:
Machine.....35%
Matchless Pivot.....45%
Payson Mfg. Co.:
Oblique.....50&10%
Shelby Spring Hinge Co.:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge.45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%

### Wrought Iron Hinges—

*Strap and T Hinges, &c., list Mar. 15, 1901:*
*Light Strap Hinges.....70%*
*Heavy Strap Hinges..75&10%*
*Light T Hinges.....60%*
*Heavy T Hinges.....60&5%*
*Extra Heavy T Hinges....75%*
*Hinge Hasps.....55%*
*Cor. Heavy Strap.....75&10%*
*Cor. Ex. Heavy T.....75%*
*Screw Hook and Strap. 6 to 12 in.....lb. 3½c; 14 to 20 in.....lb. 3¼c; 22 to 36 in.....lb. 3 c*
*Screw Hook and Eye:*
*¾ to 1 inch.....lb. 5 c*
*⅝-inch.....lb. 6 c*
*½-inch.....lb. 7 c*

Extra 5@10% often given.
Extra 2½@10&10@25&10@10&10% Extra 10% often given on most of these Hinges.

### Miscellaneous—

Hoffman's Steel Spring Butt Hinges.....
40&10%
Hoffman's Offset Refrigerator Hinges.....
40&10%

### Hods Coal—

| | 15 | 16 | 17 | 18 inch. | |
|---|---|---|---|---|---|
| *Galv. Open.* | $2.50 | 2.75 | 3.00 | 3.25 | ₱ doz. |
| *Jap. Open.* | $2.00 | 2.25 | 2.50 | 2.75 | ₱ doz. |
| *Galv. Funnel.* | $3.00 | 3.25 | 3.50 | 3.75 | ₱ doz. |
| *Jap. Funnel.* | $2.50 | 2.75 | 3.00 | 3.25 | ₱ doz. |

### Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10
Hoffman's:
Brick.....each $1.10
Masons'.....each $2.00
Plasterers'.....each $3.20

### Hoes— Eye—

*Scovil and Oval Pattern.....*
*60c@10@60c@10c@10%*
*Grub, list Feb. 23, 1899.... 70@70c@10%*
D. & H. Scovil.....35%

### Handled—

*Aug. 1, 1899, List:*
*Garden.....70c@10%*
*Meadow & Rhode Island75c@2½%*
*Southern Meadow...75c&5c@2½%*
*Mortar and Street.....75c@7½%*
*Planters', Regular Pat'n.70c&30%*
*Cotton.....75c@7½%*
*Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco.70c@10c&5%*
*Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.*
Ft. Madison Cotton Hoe.....75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $5.00
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.60
Ft. Madison Dixie Tobacco Hoe..75&20%
Gretsinger's Cut Easy.....70&10%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2½%
B. B. Cultivator Hoe.....75&10&2½%
Acme Weeding.....75&10&2½%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Extra 20%

### Hog Rings and Ringers—

See *Rings and Ringers.*

### Hoisting Apparatus—

See *Machines, Hoisting.*

### Hollow Ware—

See *Ware, Hollow.*

### Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

### Door—

Empire.....50%

### File and Tool—

Nicholson File Holders and File Handles.....58½%

### Hooks— Cast Iron—

Bird Cage, Reading.....60%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....40&10%
Clothes Line, Hoffman's.....40&10%
Clothes Line, Reading List.....
65&10@65&10&10%
Clothes Line, Sargent's List..50&20&10%
Coat and Hat, Sargent's List.....45&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Wrightsville.....65%
Harness, Hoffman.....per doz. 35@40¢
Harness, Reading List.....70&10@75%

### Wire—

*Belt.....80%*
*Wire C. & H. Hooks..60¢10@60¢10¢5%*
Atlas, Coat and Hat:
Single Cases.....50%
10 Case Lots.....50&10%
Czar Harness.....50&10&5%
Wire Coat and Hat:
Acme.....60%
B. B.....60%
V Brace, Chief and Czar.....60%
Gem.....60%
Bright Wire Goods—See *Wire.*

### Wrought Iron—

*Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.*
*Cotton.....doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

### Miscellaneous—

*Light, doz. $5.50; Medium, $6.00; Heavy, 36.50*

| *Grass.* | ¾ | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| *Best.* | | $1.50 | 1.75 | 2.00 | |
| *Common.* | $1.00 | 1.30 | 1.50 | 1.60 | |

*Potato and Manure.....60¢&20%*
*Whiffletree.....lb. 5½c*
*Hooks and Eyes:*
*Brass.....60¢10¢10@70%*
*Malleable Iron.....70¢5@70¢10%*
Covert Saddlery Works' Self Locking Gate and Door Hook.....50%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

### Horse Nails—See *Nails, Horse*

### Horseshoes—

See *Shoes, Horse.*

### Hose Rubber—

*Garden Hose, ¾-inch:*
*Competition.....ft. 4¼@ 4¼c*
*3-ply Standard.....ft. 6 @ 6¼c*
*4-ply Standard.....ft. 7¼@ 8 c*
*3-ply extra.....ft. 8½@ 9 c*
*4-ply extra.....ft. 10½@11 c*
*Cotton Garden, ¾-in., coupled:*
*Low Grade.....ft. 6 @7 c*
*Fair quality.....ft. 8 @9 c*

## Irons—Sad—

*From 4 to 10.....lb. 2¾@3c*
*B. B. Sad Irons.....lb. 3@3½c*
*Chinese Laundry.....lb. 4½@5c*
*Chinese Sad.....lb. 3½@4c*
*Mrs. Potts', per set:*

| *Nos.* | 5 | 50 | 55 | 60 | 65 |
|---|---|---|---|---|---|
| *Jap'd Tops.* | | 71c | 71c | 84c | 81c |
| *Tin'd Tops.* | | 77c | 74c | 87c | 84c |

*New England Pressing.lb. 3½@3¾c*

### Pinking—

*Pinking Irons.....doz. 50@60c*

### Soldering—

*Soldering Copper.....18@19*
*2 lb., and up.....20@21c*
Covert Mfg. Co.....20&2%

## Jack Screws—See *Screws.*

### Jacks, Wagon—

Covert Mfg. Co., Steel.....45&2%
Covert's Saddlery Works':
Daisy.....60&10%
Vict'r.....60&10%
Lockport.....50%
Lane's Steel.....50&10%

## Kettles—

*Brass, Spun, Plain.....20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

### Knife Sharpeners—

See *Sharpeners, Knife.*

### Knives—Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Hartzell Cutlery Co.....50%
Smith & Hemenway Co.....40&10%
Hay and Straw—See *Hay Knives.*

### Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

### Drawing—

*Standard List.....70&5@70&10%*
Adjustable Handle.....
Bradley's.....
C. E. Jennings & Co. Nos. 45, 46..60&10%
Jennings & Griffin, Nos. 51, 52, 60&10&10%
Swan's.....70&10&2½%
Watrous.....10&5&10%
L. & I. J. White.....20&5@25%

### Hay and Straw—

*Lightning.....per doz. $5.00@5.25*
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz $10.00
Maine.....₱ doz $8.50

### Mincing—
Buffalo ..... ₱ gro. $13.00

### Miscellaneous—
*Farriers'* ..... *doz. $2.00@3.00*
Wostenholm's ..... ₱ doz. $3.00 3.25

### Knobs—
*Base, 2¼-inch, Birch, or Maple, Rubber tip, gro* ..... *$1.10@1.20*
*Carriage, Jap, all sizes..gro. 25@30c*
*Door, Mineral* ..... *doz. 65@70c*
*Door, Por. Jap'd* ..... *doz. 70@75c*
*Door, Por. Nickel* ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutter, &c ..15%
Picture, Sargent's ..... 60&10%

### Lacing Leather—
See *Belting Leather*—

### Ladders Step Etc.—
Goshen Mfg. Co.'s step, etc ..... 50%
Lane's Store ..... 25%
Myers' Noiseless Store Ladders ..... 50%

### Ladies— Melting—
L. & G. Mfg. Co ..... 25%
P. S. & W ..... 50%
Reading ..... 60%
Sargent's ..... 40&10%

### Lanterns— Tubular—
*Regular Tubular* ..... *doz. $4.35@4.75*
*Lift Tubular* ..... *doz. $4.75@5.25*
*Hinge Tubular* ..... *doz. $4.75@5.25*
*Other Styles* ..... *40&10@40&10&5%*

### Bull's Eye Police—
*No. 1, 2¾ inch* ..... *$2.50@2.75*
*No. 2, 3 inch* ..... *$2.75@3.00*

### Latches— Gate—
Hoffman's Safety Gate ..... ₱ doz. 60c

### Thumb—
*Roggin's Latches, wit screw..dz 35@40c*

### Lawn Mowers—
See *Mowers, Lawn.*

### Leaders Cattle—
*Small* ..... *doz. 55c; large, 60c*
Covert Mfg. Co ..... 45&2%

### Lemon Squeezers—
See *Squeezers, Lemon.*

### Lifters, Transom—
Solid Grip, Payson Mfg. Co ..... 80%
R. & E ..... 33⅓%

### Lines—
| *Wire Clothes, Nos...* | *18* | *19* | *20* |
|---|---|---|---|
| *100 feet* | *$2.20* | *2.00* | *1.65* |
| *75 feet* | *$1.80* | *1.70* | *1.30* |

Ossawan Mills.
Crown Solid Braided Chalk ..... 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
₱ gr ..... 30%

### Locks— Cabinet—
*Cabinet Locks* ..... *33⅓@33⅓&10@14⅓%*

### Door Locks, Latches, &c.—
[Not prices are very often made on these goods.]
Reading Hardware Co ..... 50%
R. & E. Mfg. Co ..... 40%
Sargent & Co ..... 40@40&10%

### Elevator—
Stowell's ..... 40%

### Padlocks—
*Wrought Iron* ..... *7@10@5@80@5%*
R. & E. Mfg. Co. Wrt Steel and Brass ..... 75@75&10%

### Sash, &c.—
Fitch's:
Bronze and Brass ..... 66⅔%
Iron ..... 70%
Ives' Patent.:
Bronze and Brass ..... 55&7½%
Iron ..... 90&2½%
Wrought Bronze and Brass ..... 50&5%
Wrought Steel ..... 35%
Payson's Signal ..... 80%
Reading ..... 60&10&10@70%

### Machines— Boring—
*Com., Upright, Without Augers..$2.00*
*Com., Angular, Without Augers..$2.25*
Without Augers.

| R. & E. Mfg. Co.: | Upright. | Angular. |
|---|---|---|
| Improved No. 3 | $4.25 | No. 1 $5.00 |
| Improved No. 4 | 3.75 | No. 2 3.38 |
| Improved No. 5 | 2.75 | |
| Jennings' | No. 4, 3.15 | No. 1, 3.50 |
| Millers' Falls | | 5.75 |
| Snell's, Rice's Pat. | 2.50 | 2.75 |

### Hoisting—
Moore's Anti-Friction Differential Pulley Block ..... 30%
Moore's Hand Hoist, with Lock Brake..20%
Moore's Portable Pneumatic Hoist ..... 25%

### Ice Cutting—
Chandler's ..... 15&10%

### Washing—
Wayne American ..... ₱ doz. $28.00
Western Star, No. 2 ..... ₱ doz. 28.00
Western Star, No. 3 ..... ₱ doz 30.00
St. Louis, No. 41 ..... ₱ doz. 60.00

### Mallets—
*Hickory* ..... *45&5@50%*
*Lignumvitæ* ..... *45c@5@50%*
*Turners', Hickory and Applewood, doz* ..... *30@55c*

### Mats— Door—
Elastic Steel (W. G. Co) ..... 10%

### Mattocks—
See *Picks and Mattocks.*

### Meat Cutters—
See *Cutters, Meat.*

### Menders, Hose,
Robinson's Hose Menders ..... ₱ gro, $2.00

### Milk Cans—See *Cans, Milk*

### Mills— Coffee, etc.—
Enterprise Mfg. Co ..... 25@30%
Hoffman's Side, Coffee and Spice ..... ₱ doz. $1.25
National, list Jan. 1, '94 ..... 30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros Co ..... 30%

### Mincing Knives—
See *Knives, Mincing.*

### Molasses Gates—
See *Gates, Molasses.*

### Money Drawers—
See *Drawers, Money.*

### Mowers Lawn—
*Net prices are generally quoted.*
*Cheap* ..... *all sizes. $1.90@1.95*
*Good* ..... *all sizes, $2.25@2.50*

| | 10 | 12 | 14 | 16-inch |
|---|---|---|---|---|
| *High Grade* | *4.25* | *4.50* | *4.75* | *5.00* |
| Continental ..... | | | | 60&10% |
| Great American ..... | | | | 70% |
| Great American Ball Bearing ..... | | | | 60&10% |
| Quaker City ..... | | | | 70% |
| Pennsylvania ..... | | | | 60&10% |
| Pennsylvan a Ball Bearing ..... | | | | 60&5% |
| Pennsylvania Golf ..... | | | | 50% |
| Pennsylvania Horse ..... | | | | 40% |
| Pennsylvania Pony ..... | | | | 45% |
| Philadelphia: | | | | |
| Styles M., S., C., K., T ..... | | | | 70&5% |
| Style A, all Steel ..... | | | | 60&10% |
| Style E, Low Wheel ..... | | | | 60&10% |
| Style E, High Wheel ..... | | | | 70&10&5% |
| Drexel and Gold Coin, low list ..... | | | | 50&5% |

### Nails—
*Cut and Wire. See Trade Report. Wire Nails and Brads, Papered. List July 20, 1899* .....
*85¢10¢10@85¢10¢10¢ 10%*
*Hungarian, Finishing, Upholsterers', &c. See Tacks.*

### Horse—
| Nos. | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| A. C | 25c | 23c | 22c | 21c | 21c | 40&5% |
| Ausable | 28c | 28c | 25c | 24c | 23c | 50&10% |
| C. B. K | 25c | 25c | 22c | 21c | 21c | 40% |
| Champ'in | 28c | 26c | 25c | 24c | 23c | 40&10&5% |
| Clinton | 19c | 17c | 16c | 15c | 14c | 30&10&5% |
| Maud S | 25c | 23c | 22c | 21c | 21c | 50% |
| Putnam | 23c | 21c | 20c | 19c | 18c | 33⅓% |
| Putnam | | | | | | |
| Col'd Rol'd | 19c | 18c | 17c | 16c | | 10&10% |
| Vulcan | 23c | 21c | 20c | 19c | 18c | 25&10% |
| American, Nos. 5 to 10 | | | | | | ₱ ℔ 9@9½c |
| Neponset | | | | | | Nos. 5 to 10 ₱ ℔ 12c |
| *Jobbers' special brands...per lb.* | | | | | | *8@9c* |

### Picture
| | 1½ | 2 | 2¼ | 3 | 3½ in. |
|---|---|---|---|---|---|
| *Brass Head* | *.45* | *.60* | *.70* | *.95* | *1.00 gro.* |
| *Por. Head* | *..* | *1.10* | *1.10* | *1.10* | *.. gro.* |
| Crown Picture Nails | | | | | ₱ gro. $1.50 |

### Needles Tobacco—
Nagley's Tin Tobacco ..... ₱ doz. $2.00

### Nippers, See *Pliers and Nippers.*

### Nut Crackers—
See *Crackers, Nut.*

### Nuts—
*Cold Punched: Off list.*
*Mfrs. or U. S. Standard.*
*Square, plain* ..... *$4.50*
*Hexagon, plain* ..... *$4.60*
*Square, C. T. & R* ..... *$4.70*
*Hexagon, C. T. & R* ..... *$5.00*
*Hot Pressed:*
*Mfrs., U. S. or Nar. Gauge Stan'd.*
*Square Blank* ..... *$5.00*
*Hexagon Blank* ..... *$5.20*
*Square Tapped* ..... *$4.80*
*Hexagon Tapped* ..... *$5.00*

### Oakum—
*Best or Government* ..... *lb. 6¼c*
*Navy* ..... *lb. 5 c*
*U. S. Navy* ..... *lb., 5¾c*
*Plumbers' Spun Oakum* ..... *5¾c*
*In carload lots ¾c lb. off f. o. b. New York.*

### Oil Axle—
Snow Flake:
1 pt. cans, per doz ..... $3.00
1 qt. cans, per doz ..... $4.80
1 gal. cans, per doz ..... $15.00
5 gal. cans, per doz ..... $66.00
} 33⅓&10%

### Oil Tanks—See *Tanks, Oil.*

### Oilers—
*Brass and Copper* ..... *65@65&10%*
*Tin or Steel* ..... *70&10@75%*
*Zinc* ..... *75@75&5%*
*Chas. or Paragon:*
*Brass and Copper* ..... *65&5@65&10%*
*Tin or Steel* ..... *75@75&10%*
*Zinc* ..... *70@70&10%*
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Ame ican Tube & stamping Co.:
Spring Bottom Cans ..... 70&70&10%
Railroad Oilers etc ..... 60&60&10%

### Openers— Can—
*French* ..... *doz. 35c*
*Iron Handle* ..... *doz. 20@25c*
*Sprague, Iron Hdle..per doz 35@40c*
*Sardine Scissors...doz. $1.75@$3.00*
Tip Top ..... per doz. $0.75
National ..... 50%
Stowell's ..... per doz. 35@45c

### Egg—
Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

### Packing—
*Asbestos Packing, Wick and Rope, 15@15½c lb.*

### Rubber—
*Sheet, C. L* ..... *8@12c*
*Sheet, C. O. S* ..... *9@13c*
*Sheet, C. B. S* ..... *10@14c*
*Sheet, Pure Gum* ..... *50@70c*
*Sheet, Red* ..... *35@40c*
Jenkins' Standard, ₱ ℔ 80¢ ..... 25@25&5%

### Miscellaneous—
*American Packing* ..... *7@10c lb.*
*Cotton Packing* ..... *13@15c lb.*
*Italian Packing* ..... *9@12½c lb.*
*Jute* ..... *3½@4c lb.*
*Russia Packing* ..... *7@11c lb.*

### Pails— Creamery
S. S. & Co., with gauges.. No 1 $6.25; No. 2, $4.50 ₱ doz.

### Galvanized—
Price per doz.

| | *Quart* | *10* | *12* | *14* |
|---|---|---|---|---|
| *Water, Regular* | | *1.75* | *2.00* | *2.25* |
| *Water, Heavy* | | *2.75* | *3.00* | *3.25* |
| *Fire, Rd. Bottom* | | *2.30* | *2.60* | *2.80* |
| *Well* | | *2.25* | *2.50* | *2.75* |

### Pans— Dripping—
*Standard List* ..... *60@60@5%*

### Fry—
*Common Lipped:*

| *No.* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| *Per doz.* | *$0.95* | *1.05* | *1.15* | *1.30* | *1.65* |

### Roasting and Baking—
Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Simplex, ₱ doz.:

| No. | 40 | 50 | 60 | 140 | 150 | 160 |
|---|---|---|---|---|---|---|
| | $2.75 | 3.25 | 3.75 | 3.00 | 3.25 | 4.00 |

### Paper—Building Paper—
| *Asbestos:* | *lb.* |
|---|---|
| *Building Felt* | *2¾c* |
| *Mill Board, sheet, 40 x 40 inches* | *3¼c* |
| *Mill Board, roll, thicker than 1-16 inch* | *3¼c* |
| *Mill Board, roll, 1-16 in. thick and less* | *2¼c* |
| | *Per roll* |
| *Rosin Sized Sheathing: 500 sq. ft.* | |
| *Light wt., 25 lbs. to roll* | *$0.35@0.37* |
| *Medium wt., 30 lbs. to roll* | *$0.42@0.45* |
| *Heavy wt., 40 lbs. to roll* | *$0.50@0.60* |
| *Medium Grades Water Proof Sheathing* | *$0.65@1.25* |
| *Deafening Felt, 5, 6 and 4½ sq. ft. to lb., ton* | *$45.00* |
| *Red Rope Roofing, 250 sq. feet per roll* | *$1.65* |

NOTE.—*These goods are often sold at delivered prices.*

### Tarred Paper.
| *1 ply (roll 300 sq. ft.), ton* | *$29.00@32.00* |
|---|---|
| *2 ply, roll 108 sq. ft* | *55@65c* |
| *3 ply, roll 108 sq. ft* | *77@87c* |
| *Slater's Felt (roll 500 sq. ft.)* | *70@75c* |

NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) ..... $2.75

### Sand and Emery—
*List Dec. 23, 1899* ..... *60@60&10%*

### Parers— Apple—
Advance ..... ₱ doz. $4.50
Baldwin ..... ₱ doz. $5.00
Bonanza Improved ..... each $6.50
Dandy ..... each $7.50
Eureka Improved ..... each $20.00
Family Bay State ..... ₱ doz. $15.00
Hudson's Little Star ..... ₱ doz. $4.00
Hudson's Rocking Table ..... ₱ doz. $5.50
Improved Bay State ..... ₱ doz. $36.00
New Lightning ..... ₱ doz. $7.50
Reading 72 ..... ₱ doz. $4.00
Reading 78 ..... ₱ doz. $7.00
Turn Table '98 ..... ₱ doz. $6.75
White Mountain ..... ₱ doz. $6.00

### Potato—
Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $6 00

### Picks and Mattocks—
*List Feb. 23, 1899* ..... *70@70c&10%*

### Pigeons— Clay
Mark e's Black Birds, f. o. b. factory, per M ..... $2.75
See also *Traps, Target.*

### Pinking Irons—
See *Irons, Pinking.*

### Pins— Escutcheon—
*Brass* ..... *60@60@10%*
*Iron, list Nov 11, '85* ..... *60@60@10%*

### Pipe, Cast Iron Soil—
*Standard, 2-6 in* ..... *50@10@5%*
*Extra Heavy, 2-6 in* ..... *65@5%*
*Fittings* ..... *7@5%*

### Pipe Merchant, Boiler Tubes, &c.—
*Carload Lots, f. o. b. Pittsburgh.*

| *Merchant Pipe.* | *Black.* | *Galvanized.* |
|---|---|---|
| *⅛, ¼, ⅜ inch* | *68%* | *58%* |
| *½ inch* | *70%* | *60%* |
| *¾ to 6 inch* | *75%* | *65%* |
| *7 to 12 inch* | *73%* | *63%* |

*Less than carloads, 12½% advance.*

### Pipe Sewer—
*Jobbers' Prices—*
*Standard Pipe and Fittings, 2 to 24 in.*
*New England* ..... *70%*
*New York and New Jersey* ..... *73%*
*Maryland, Delaware, East Penn.* ..... *71%*
*West Penn and West Va* ..... *76%*
*Virginia* ..... *75%*
*Ohio, Michigan and Ky* ..... *78%*
*Carload lots are generally delivered.*

### Planes and Plane Irons—
### Wood Planes—
*Molding* ..... *50@2½@50@5%*
*Bench, First quality* ..... *45@10@45@10@5%*
*Bench, Second qual* ..... *50@10@50@10@5%*
Bailey's (Stanley R. & L. Co) ..... 5&10&25&10&10%
Chapin-Stephens Co.:
Bench, Common (Pearce) ..... 30&10&50&10&5%
Bench Extra and Pemium ..... 45&10@45&10&5%
Molding ..... 40&2½@40&10%
Gage Self Setting ..... 35%
Union ..... 60%

### Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Sargent's ..... 60%
Union ..... 60%

### Plane Irons—
*Wood Bench Plane Irons* ..... *30@5@30@10@5%*
Buck Bros ..... 30%
Chapin-Stephens Co ..... 30@30&10&5%
Stanley R. & L. Co ..... 20&10@20&10&10%
L. & L. J. White ..... 20&5@25%

### Planters, Corn, Hand.
Kohler's Eclipse ..... ₱ doz. $9.00

### Plates—
*Felloe* ..... *lb 3¼@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00 ..... 50%

### Pliers and Nippers—
*Button Pliers* ..... *75@75@10%*
*Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45*
*Gas Pipe* ..... *7 8 10 12-in.*
*$1.75 $2.00 $2.75 $3.75*
Acme Nippers ..... 50@50&5%
Bernard's:
Parallel Pliers ..... 95%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 50&5%
Elm City Fence Pliers ..... 35%
Cronk & Carrier Mfg. Co.:
American Butto ..... 75&10%
Cronk's ..... 60%
Improved Button ..... 70&10%
Stub's Pattern ..... 50%
Combination and others ..... 33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40& 0&10%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers ..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds ..... 40%

### Plumbs and Levels—
*Plumbs and Levels* ..... *75@75&10%*
Chapin-Stephens Co.:
Pocket Levels ..... 40@40&10&10%
Plumbs and Levels ..... 40@40&10&10%
Disston's Plumbs and Levels ..... 70%
Disston's Pocket Levels ..... 70%
C. E. Jennings & Co.'s Iron ..... 25&10%
C. E. Jennings & Co.'s Iron, Adjustable, 33⅓&10%
Stanley R. & L. Co ..... 40@40&10&10%
Stanley's Duplex ..... 20@20&10&10%
Woods' Extension ..... 33⅓%

### Poachers, Egg—
Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, ₱ .00; No. 3, $1.00; No. 4, $12. 0 ..... 50%

### Points, Claziers'—
| *Bulk and 1 lb. papers..* | *lb.* | *8½c@..* |
|---|---|---|
| *½-lb. papers* | *lb.* | *9 c@..* |
| *¼-lb. papers* | *lb.* | *9½c@..* |

### Pokes, Animal—
Ft. Madison Hawkeye ..... ₱ doz. $3.25
Ft. Madison Western ..... ₱ doz. $4.00

### Police Goods—
*Manufacturers' Lists* ..... *25@25&5%*
Tower's ..... 25%

### Polish—Metal—
Burnishine Liquid, ₱ doz., ½ pt., $1.25; 1 pt., $2.00; 1 qt., $3.50.
Burnishine Paste, ₱ doz. 3 oz., $0.50; ½ lb., $1.25; 1 lb., $2.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz ..... $2.00

### Stove—
Black Eagle Benzine Paste, 5 ℔ cans .. ₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₱ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₱ ℔ 8¢
Fireside ..... ₱ gr. $2.50
Gem, ₱ gr. $4.50 ..... 10%
Japanese ..... ₱ gr. $3.50
Jet Black ..... ₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail ..... each 70¢
Black Silk, ½ ℔ box ..... ₱ doz. $1.00
Black Silk, 5 oz. box ..... ₱ doz. $0.75
Black Silk, ½ pt. liq ..... ₱ doz. $1.00

### Window and Glass Cleaner.
The Glasbrite Company:
No. 1, 10-cent size, case of 2 doz ..$1.70
No. 3, 25-cent size, case of 1 doz..$2.00
Mfgrs' size 1-lb. cakes, each ..... 9.35
Mfg s' size, 1-lb. cakes, per doz..$3.00

### Poppers, Corn—
*1 qt., Square* ..... *gro. $9.00*
*1 qt., Round* ..... *gro. $10.00*
*1½ qt., Square* ..... *gro. 11.00*
*2 qt., Square* ..... *gro. 13.00*

### Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

### Potato Parers—
See *Parers, Potato.*

### Pots— Glue—
*Enameled* ..... *40%*
*Tinned* ..... *50%*

### Powder—
*In Canisters:*
*Duck, 1 lb. each* ..... *45c*
*Fine Sporting, 1 lb. each* ..... *75c*
*Rifle, ½-lb. each* ..... *15c*
*Rifle, 1-lb. each* ..... *25c*
King's Semi-Smokeless:
Keg (25 ℔ bulk) ..... $6 50
Half Keg (12½ ℔ bulk) ..... $3.50
Quarter Keg (6¼ ℔ bulk) ..... $1.90
Case 24 (1 ℔ cans bulk) ..... $8.50
Half case (1 ℔ cans bulk) ..... $4 50

| King's Smokeless: | Shot Gun | Rifle |
|---|---|---|
| Keg (25 ℔ bulk) | $12 00 | $15.00 |
| Half Keg (12½ ℔ bulk) | 6.25 | 7.75 |
| Quarter Keg (6¼ ℔ bulk) | 3.25 | 4.00 |
| Case 24 (1 ℔ cans bulk) | 14.00 | 17 00 |
| Half case 12 (1 ℔ cans bulk) | 7.25 | 8 75 |

### Presses—
### Fruit and Jelly—
Enterprise Mfg. Co ..... 20@25%
Sensible ..... 33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

### Seal Presses—
Morrill's No. 1, per doz. $20.00 ..... 50%
Morrill's No. 2, per doz. $22 50 ..... 50%

### Pruning Hooks and Shears—See *Shears.*

### Pullers Nail—
Cyclops ..... 50%
Miller's Falls, No. 3, per doz. $12.00 ..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50 ..... 50%
Pelican, ₱ doz. $9.00 ..... 40&10%
Samson ..... ₱ doz $18.00
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No. 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4 50; No. 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax ..... 60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka ..... 50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Yankee ..... 66⅔%

## Pulleys—Single Wheel—

| | | | | |
|---|---|---|---|---|
| *Inch* | | 2 | 2½ | 3 |
| *Awning ...doz.* | | *$0.50* | *.75* | *1.00* |
| *Hay Fork, Swivelor Solid Eye* | | | | |
| *doz., 4 in..* | *$0.95* | *; 5 in ,* | *$1.25* | |
| *Inch* | | 2 | 2¼ | 2½ |
| *Hot House, doz* | | *$0.60* | *.80* | *1.10* |
| *Inch* | 1¼ | 1½ | 1¾ | 2 |
| *Screw....doz.* | *$0.14* | *.17* | *.20* | *.26* |
| *Inch* | 1¾ | 2 | 2¼ | 2½ |
| *Side.....doz.* | *$0.27* | *.35* | *.48* | *.55* |
| *Inch* | 1½ | 1¾ | 2 | 2½ |
| *Tackle ...doz.* | *$0.27* | *.37* | *.50* | *.89* |

Stowell's:
- Ceiling or End, Anti-Friction ..... 60%
- Dumb Waiter, Anti-Friction...60&10%
- Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00 ..... 50%
- Electric Light ..... 60%
- Side, Anti-Friction..... 60&10%

## Sash Pulleys—

*Common Frame; Square or Round End per doz., 1¾ in., 13c; 2 in., 16c*
*Auger Mortise, no Face Plate, per doz. 1¾ in., 13c.; 2 in., 15c.*
*Auger Mortise, with face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.*
Acme.....1¾ in., 16c; 2 in., 19c
Common Sense, 1¾ in.... ₱ doz., 18c; 2 in., 20c.
Fox: All Steel, Nos. 3 and 7, 2½ in. ₱ doz 25c
- No. 9, 1¾ in. ..... ₱ doz. 20c
- Extra for Plated Finish ...₱ doz. 20c
- Extra for Anti-Friction Bronze Bushing..... ₱ doz 10c

Grand Rapids All Steel Noiseless....40%
Ideal No. 13.....1¾ in., ₱ doz., 16c
Niagara.....1¾ in., 16c; 2 in., 19c
No. 26, Troy....1¾ in., 14½c; 2 in., 16½c
Star.....1¾ in., 16c; 2 in., 19c
Tackle Blocks—See *Blocks.*

## Pumps—

*Cistern.....60@60&1%*
*Pitcher Spout.....75@75&10%*
*Wood.....50@50&10%*
*Pump Leathers, Lower and Plunger Valves—Per gro.:*

| *Inch..* | 2 | 2¼ | 2½ | 2¾ |
|---|---|---|---|---|
| | *$2.20* | *2.50* | *2.75* | *3.00* |
| *Inch..* | 3 | 3¼ | 3½ | 3¾ | 4 |
| | *$3.30* | *3.60* | *3.85* | *4.10* | *4.40* |

Barnes Dbl. Acting (low list)..... 50%
Contractors' Rubber Diaphragm N., 2 H. & L. Block Co ..... $10.00
Flint & Walling's Fast Mail (low list)..35%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list ..... 50%
Myers' Power Pumps ..... 50%
Myers' Spray Pumps ..... 50&10%

## Punches—

*Saddlers' or Drive, good...doz. 65@70c*
*Spring, single tube, good quality... $1.75@2.00*
*Revolving (4 tubes)...doz. $3.75@4.00*
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check ..... 55%
Bemis & Call Co.'s Spring ..... 50%
Morrill's No. 1 (A. B. C.), ₱ doz., $15.00 ..50%
- No. 2, ₱ doz. $22.50 ..... 50%
- No. 2, Metal, ₱ doz., $15.00 ..... 50%
- Bench Punch, each, $10.00 ..... 50%

Niagara Hollow Punches ..... 40%
Niagara Solid Punches ..... 55&10%
Steel Screw, B. & K. Mfg. Co ..... 40%
Tinners Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44 ..... 60%

## Rail— Barn Door, &c.—

*Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:*

| ½ | ⅝ | ¾ *In* |
|---|---|---|
| *$1.70* | *$2.20* | *$3.00 100 feet.* |

*Angular for Sq. Groove Wheels:*

| *Small.* | *Med.* | *Large.* |
|---|---|---|
| *$1.60* | *1.95* | *2.70 100 feet.* |

*Sliding Door, Brazed Wr't Iron, ft. 65c*
*Sliding Door, Iron Painted....2½@3c*
*Sliding Door, Wrought Brass, 1 in..... lb. 36c .30%*
Allith Mfg Co. Reliable Hanger Track ₱ foot ..... 10c
Cronk's Double Braced Steel Rail, ₱ foot ..... 3¾c
Cronk's O. N. T. Rail..... 3¾c
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $4.00; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft. ..... 3.75
Lawrence Bros.' ..... ₱ ft. 4¼c
Lawrence Bros., New York ..... 3¾c
McKinney's Hinged Hanger Rail ₱ foot 11c ..... 5%
McKinney's None Better..... ₱ ft. 3¾c
McKinney's Standard..... ₱ ft. 4 c
Myers' Stayon Track ..... 50&10%
Smith's Wrought Bracket, Plain.....3¾c
Smith's Special..... 4¼c
Smith's Never Jump, per ft. 11c.....50%
Smith's Plain Steel..... 30%
Smith's Milled Steel..... 4¼c
Stowell's Cast Rail..... 4¼c
Stowell's Steel Rail, Plain..... 25%
Stowell's Wrought Bracket, Plain ..3¾c
Swett's Hylo, per ft. 11c ..... 50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

## Rakes—

*Net Prices, Malleable Rakes:*

| *10* | *12* | *14* | *16-tooth* |
|---|---|---|---|
| *Shank.....$1.50* | *1.60* | *1.75* | *1.85* |
| *Socket... $1.65* | *1.80* | *1.95* | *2.10* |

*Steel, August 1, 1899, List...70c&5c&20%*
*Malleable.....70c&10@75c&5%*
*Lawn Rakes, Metal Head, per doz.,*
*20 teeth.....$3.25@3.50*
*24 teeth.....$3.60@3.75*
Fort Madison Red Head Lawn ....$3 25
Fort Madison Blue Head Lawn.....$3 00
Jackson Lawn, 29 and 30 teeth ₱ doz. $4.00
Kohler's:
- Lawn Queen, 20-tooth, ₱ doz.....$3.60
- Lawn Queen, 24-tooth, ₱ doz. ....$3.75
- Paragon, 20-tooth, ₱ doz.....$2.85
- Paragon, 24-tooth, ₱ doz.....$3.00
- Steel Garden, 14-tooth, ₱ doz.....$3.00
- Malleable Garden, 14-tooth ₱ doz. $2.25

## Rasps, Horse—

Disston's..... 75%
Heller Bros..... 70&5&70&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson ..... 70&10%
See also *Files*

## Razors—

Boraic ..... 60&10%
Fox Razors, No. 42... ₱ doz. $20.00 } 40 & 10%
Fox Razors, No. 44, ...₱ doz. $21.00 }
Fox Razors, No. 82, Platina, ₱ doz $25.00
Red Devil..... 60%
Silbersteln:
- Carbo Magnetic..... $18.00
- Griffon, No. 65..... $15.00
- Griffon, No. 00 ..... $12.00
- All other Razors..... 40%
- Safety Razors..... 40%

## Safety Razors—

New Gem, in Tin Boxes..... ₱ doz. $12.00
New Gem, Extra Blades ..... ₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case..... ₱ doz. $24.00

## Reels— Fishing—

Bissop's Independent Fish Reel Spooler, ₱ doz..... $80 00
Hendryx:
- M 6, Q 6, A 6, B 6, M 9¼ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 0 N, 6 N, 4 N to 8 PN..... 33⅓%
- 6 RW, 102 P and RN, 202 P and PN..40%
- G 9..... 20%
- 24 N to 28 PN..... 35&10&10%
- 124 N, 974 PN, 002304 PN, 1020 R and PRN, 202 PR and PRN.... 50&5%
- 2304 N..... 40&10&5%
- 5009 PN and N..... 50%
- 2904 P..... 50&10&5%
- 2904 PN..... 60%
- 0925 N..... 40&10%
- 02084 N..... 45&12½&5%
- Single Action Trout..... 40&10%
- 986 P N, 802 and 802 N..... 50&10%
- Competition, 304 and 304 PN ..... 35%
- 00304 P and PN..... 40&5%
- Safety and Salmon..... 30%

Shakespeare, Style C..... 25%

## Registers—*List Sept. 2, 1901.*

| | |
|---|---|
| *Black Jap* | 75&10 @ 80&10% |
| *White Jap* | |
| *Bronzed* | |
| *Nickel Plated* | |
| *Electro Plated* | |

*There is a good deal of irregularity in prices of Registers.*

## Revolvers—

*Single Action..... 85@90c*
*Double Act'n, except 44 cal. $1.35@1.50*
*Double Action, 44 calibers, $1.60@1.65*
*Automatic ..... $2.75@3.00*
*Hammerless..... $3.25@3.50*

## Riddles, Grain or Sand—

*16 in. per doz..... $2.75@3.00*
*17 in. per doz..... $3.00@3.25*
*18 in. per doz..... $3.25@3.50*

## Rings and Ringers—

### Bull Rings—

| | 2 | 2½ | 3 *Inch.* |
|---|---|---|---|
| *Steel.....$0 70* | | *0.75* | *0.80 doz.* |
| *Copper..... 1.00* | | *1.10* | *1.35 doz.* |

### Hog Rings and Ringers—

*Hill's Rings....gro. boxes, $4.25@4.50*
*Hill's Ringers, Gray Iron, doz. 55@ 60c*
*Hill's Ringers, Mal. Iron, doz. 75@80c*
*Flair's Rings.....per gro. $5.00@5.25*
*Blair's Ringers...per doz. $0.60@ .65*
*Brown's Rings....per gro. $5.50@5.75*
*Brown's Ringers...per doz. $0.75@1.00*
Rapid Rings..... ₱ gro. $6.00
Rapid Ringers..... ₱ doz. $3.50

## Rivets and Burrs—

*Copper.....50c&10@50c&10@15c&5%*
*Iron or Steel:*
- *Tinners' ..... 75@75&10%*
- *Miscellaneous..... 75@75&10%*

## Rollers—

Acme, Stowell's Anti-Friction ..... 50%
Barn Door, Sargent's list..... 60%
Cronk's Stay ..... 66⅔%
Cronk's Brinkerhoff ..... 66⅔%
Lane's, Stay ..... 33⅓&5%
Stowell's Barn Door Stay... ₱ doz. $1.25

## Rope—

*Manila, 7-16 in. and larger,*
*Manila, 7-16 in. and larger, tarred or untarred...lb. 11 @11½c*
*Manila.....¾-inch lb. 11½@12 c*
*Manila ¼ & 5-16 in.....lb. 12 @12½c*
*Manila Hay, Hide and Tackle, Ropes Medium and Coarse..... lb. 12 @12½c*
*Sisal, 7-16 in. and larger lb. 7¾@ 9½c*
*Sisal.....¾-inch. lb. 8¾@10 c*
*Sisal, ¼ and 5-16 in. ...lb. 8¾@10½c*
*Sisal, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 7¾@ 9½c*
*Sisal, Tarred, Medium Lath Yarn.....lb. 7½@ 9 c*
*Cotton Rope:*
- *Best.....¼-in. and larger lb. 13½c*
- *Medium...¼-in. and larger lb. 11 c*
- *Common.....¼-in. and larger lb. 9 c*

*Jute Rope:*
- *Thread No. 1, ¼ in. and up lb. 6½c*
- *Thread No. 2, ¼-in. and up lb. 6 c*
- *Yarn, ¼ in. and up... lb. 5 @5½c*

## Wire Rope—

*Galvanized ..... 40&5%*
*Plain..... 15&5%*

## Ropes, Hammock—

Covert Mfg. Co..... 45&2%
Covert Saddlery Works..... 60&5%

## Rules—

*Boxwood..... 60&5@60&10&5%*
*Ivory..... 35&10@35&10&10%*
Chapin-Stephens Co.:
- Boxwood..... 60@60&10%
- Ivory..... 35&10@35&10&10%
- Miscellaneous ..... 50&10@50&10&10%
- Patent Combination..... 55@55&10%
- Stationers' Rulers ..... 10@10&10%

Lufkin's Steel..... 50&10%
Lufkin's Lumber ..... 60&10%
Stanley R. & L. Co.:
- Boxwood..... 60@60&10%
- Ivory..... 35@35&10&10%

Upson Nut Co.:
- Boxwood..... 60@60&10%
- Ivory..... 35&10@35&10&10%

## Sash Locks—See *Locks, Sash*

## Sash Weights—

See *Weights, Sash.*

## Sausage Stuffers or Fillers

See *Stuffers or Fillers, Sausage.*

## Saw Frames—See *Frames, Saw.*

## Saw Sets—See *Sets, Saw.*

## Saw Tools—See *Tools, Saw.*

## Saws—

Atkins:
- Circular ..... 50@50&10%
- Band ..... 50&10@60%
- Cross Cuts ..... 35&5%
- Mulay, Mill and Drag ..... 50&10%
- One-Man Saw ..... 40%
- Wood Saws ..... 40%
- Hand, Compass, &c ..... 40%

Chapin-Stephens Co.: Turning Saw Frames and Saws..... 30@30&10%
Diamond Saw and Stamping Works: Sterling Kitchen Saws..... 25%
Disston's:
- Circular Solid and Inserted Tooth..50%
- Band 3 to 14 m. wide..... 60%
- Band ¼ to 2¼..... 70%
- Crosscuts..... 45%
- Narrow Crosscuts..... 50%
- Mulay, Mill and Drag..... 50%
- Framed Woodsaws..... 35%
- Woodsaw Blades..... 35%
- Woodsaw Rods..... 25%
- Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8..... 25%
- Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
- Compass, Keyhole, &c..... 25%
- Butcher Saws and Blades..... 35%

C. E. Jennings & Co.'s:
- Back Saws..... 25&10%
- Butcher Saws..... 30&10%
- Compass and Key Hole Saws..35&5&10%
- Framed Wood Saws..... 30&10%
- Hand Saws..... 20&2½&10%
- Wood Saw Blades..... 30&10%

Millers Falls:
- Butcher Saws..... 15&10%
- Star Saw Blades..... 15&10%

Peace:
- Circular and Mill ..... 50%
- Cross Cuts, list Jan. 1, '99..... 50%
- Hand, Panel and Rip..... 30%

Richardson:
- Circular and Mill ..... 50%
- Hand, &c..... 30%
- X Cuts, list Jan. 1, '99..... 50%

Simonds':
- Circular Saws..... 50%
- Crescent Ground Cross Cut Saws..35%
- One-Man Cross Cuts..... 40&10%
- Gang Mill, Mulay and Drag Saws..50%
- Rind Saws..... 50%
- Back Saws..... 25@25&7½%
- Butcher Saws..... 35@35&7½%
- Hand Saws..... 25@25&7½%
- Han I Saws, Bay State Brand ... 25%
- Compass, Keyhole, &c ..... 25@25&7½%
- Wood Saws..... 35@35&7½%

## Hack Saws—

Disston:
- Concave Blades..... 25%
- Keystone..... 40%
- Hack Saw Frames..... 30%

Fitchburg File Works, The Best..... 25%
C. E. Jennings & Co.'s:
- Hack Saw Frames, Nos. 175, 180..... 35&5&10%
- Hack Saws, Nos. 175, 180, complete. 35&5&10%

Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades..... 35&5&10%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades..... 25%
Sterling Hack Saw Frames ..... 20%

## Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

## Scalers, Fish—

Bishop's Lightning ..... ₱ doz. $2.00
Covert's Saddlery Works ..... 6&10%

## Scales—

*Family, Turnbull's.....30@30&10%*
*Counter:*
- *Hatch, Platform, ½ oz. to 24 lbs. doz $5.50*
- *Two Platforms, ½ oz. to 8 lbs., doz. $10*
- *Union Platform, Plain...$1.70@1.90*
- *Union Platform, Striped $1.85@2.15*

Chatillon's:
- Eureka..... 25%
- Favorite..... 40%
- Grocers' Trip Scales..... 50%

Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing..... 70%
"The Standard" Portables ..... 45%
"The Standard" R. R. and Wagon.... 50%

## Scrapers—

*Box, 1 Handle .....doz $2.25@2.50*
*Box, 2 Handle..... doz. $3.00@3.50*
*Ship..... Light $2.50; Heavy, $4.00*
Adjustable Box Scraper (S. R. & L. Co.) $8.00..... 30@30&10%
Chapin-Stephens Co., Box Scrapers..... 50@50&10%

## Screens, Window, and Frames—

Bonanza Window Screens..... 60@60&5%
Elver Pattern Window Screen..60@60&5%
Maine Window Screen Frames 40&10&5%
Perfection Window Screens..... 60@60&5%
Phillips' Window Screen Frames..... 60&10&5%
Porter's Hummer Window Screens.. 60@60&5%
Porter's Klondike Window Screens .... 60@2½@60&2½%
Wabash Spring Adj. Screen..... 50%
See also *Doors.*

## Screw Drivers—

See *Drivers, Screw.*

## Screws—Bench and Hand—

*Bench, Iron...doz. 1 in., $2.75@3.00; 1¼, $3.25@3.50; 1¼, $3.85@4.25*
*Bench, Wood, Beech...doz. $3.00@3.50*
*Hand, Wood..... 30@30&5%*
Hand, R. Bliss Mfg Co..... 35%
Hand, Chapin-Stephens Co ..... 30@30&10%

## Coach, Lag and Hand Rail—

*Lag, Common Point, list Oct. 1, '99..... 70&15@...%*
*Coach and Lag, Gimlet Point, list Oct. 1, '99..... 70&10@...%*
*Hand Rail, list Jan. 1, '81.60&10@...%*

## Jack Screws—

*Standard List..... 75&10@50&5%*
Millers Falls..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W..... 50&50&10%
Sargent..... 70&10%

## Machine—

*List Jan. 1, '98.*
*Flat or Round Head, Iron..50@50&10%*
*Flat or Round Head, Brass..50@50&10%*

## Set and Cap—

*Set (Iron or Steel) ..... 70%*
*Sq. Hd. Cap... ..... 65%*
*Hex. Hd. Cap ..... 65%*
*Rd. or Fillister Hd. Cap ..... 60%*

## Wood—

*List Jan. 1, 1900.*
*Manufacturers' printed discounts:*
*Flat Head, iron..... 90%*
*Round Head, Iron..... 87½%*
*Flat Head, Brass ..... 87½%*
*Round Head, Brass..... 85%*
*Flat Head, Bronze..... 80%*
*Round Head, Bronze..... 77½%*
*Drive Screws..... 90%*
NOTE.—*Extra 10&5&10&10% often given.*

## Scroll Saws—See *Saws, Scroll.*

## Scythes—

*Per doz.*
*Clipper Pattern, Grass..... $5.00*
*Full Polished Clipper..... $5.50*
*Grain ..... $7.50*
*Clipper, Grain..... $8.25*
*Wood and Brush ..... $5.00*

## Scythe Snaths—

See *Snaths, Scythe.*

## Seeders— Raisin—

Enterprise..... 25@30%

## Sets— Awl and Tool—

*Brad Awl and Tool Sets:*
*Wood Hdle...10 awls doz. $2.00@2 25*
*Wood Hdle., 14 Awls, 6 Tools doz. $2.50@2.60*
Aiken's Sets, Awl and Tools No. 20, ₱ doz. $10.00..... 50&10&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
C. E. Jennings & Co.'s Model Tool Holders..... 30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior: No. 1, $7.50; No. 2 $4.00; No. 3, $5.50..... 40&40&10&10%

## Garden Tool Sets—

Ft. Madison, Taree Pc., Hoe, Rake and Shovel ..... ₱ doz sets..... $ .00

## Nail—

*Square..... per gro. $2.25@2.50*
*Round, Blk. and Pol., assorted..... gro. $1.80@2.50*
*Octagon..... gro. $4.00@4.25*
*Knurled, Good..... gro. $5.75@6.00*
Buck Brothers..... 27½%
Cannon's Diamond Point, ₱ gr. $12.. 25%
Mayhew's..... per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt.....per gro $7.50

## Rivet—

*Regular list..... 70c&10@75%*

## Saw—

Aiken's:
- Genuine..... 50&10%
- Imitation..... 50&10%

Atkin's:
- Criterion..... 10%
- Adjustable..... 40%

Bemis & Call Co's.:
- Cross Cut..... 30%
- Hammer, new Pat..... 45%
- Plate..... 20%
- Spring Hammer..... 30%

Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00..... 50%
- Nos. 3 and 4, Cross Cut, $20.63.... 50%
- No. 5, Mill, $30.00..... 50%
- Nos. 10, 11, 95, $17.81..... 50%
- No. 1 Old Style, $10.00..... 50%

Taintor Positive, ₱ doz. $18..... 60%

## Sharpeners, Knife—

Chicago Wheel & Mfg. Co..... 65%
Smith & Hemenway Co..... 70%

## Shaves, Spoke—

*Iron..... doz. $1.00@1 15*
*Wood..... doz. $1.65@2.25*
Bailey's (Stanley R. & L. Co.)..... 50&50&10&10%
Chapin-Stephens Co ..... 20&50&10&10%
Goodell's, ₱ doz. $9.00..... 15&10%
Wood's F1 and F2..... 50%

## Shears—

| *Cast Iron...* | *7* | *8* | *9 in.* |
|---|---|---|---|
| *Best .. ..* | *$16.00* | *18.00* | *20.00 gro.* |
| *Good.....* | *$13.00* | *15.00* | *17.00 gro.* |
| *Cheap.... ..* | *$7.00* | *6.00* | *7.00 gro.* |

*Straight Trimmers, &c.:*
- *Best quality, Jap..... 70@70c&10%*
- *" Nickel.....60@60c&10%*
- *Fair qual, Jap..... 80@80c&5%*
- *" Nickel..... 75@75c&10%*

*Tailors' Shears..... 40@40c&10%*
Acme Cast Shears..... 40@40&5%
Geneva..... 60%
Heinisch's Tailors' Shears..... 40%
Wilkinson's Hedge..... 1900 list 45%
Wilkinson's Pruning..... 40%
Wilkinson's Sheep..... 1900 list 25%

## Tinners' Snips—

*Steel Blades..... 20c&5@20 c&10%*
*Steel Laid Blades ..... 50c&10@55c&5%*
Forged Handles, Steel Blades, Berlin ..... 40@40&10%
Jennings & Griffin Mfg. Co's. 6½ to 10 inch..... 40&7½&10%
Niagara Snips..... 40%
P., S. & W. Co..... 20%

## Pruning Shears and Tools—

Cronk's Grape Shears ..... 33⅓%
Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00..... 25%
Disston's Pruning Hook, ₱ doz. $12.00 ..... 25%
John T. Henry Mfg. Company:
- Pruning Shears, all grades..40@40&5%
- Orange Shears..... 50&10@50&20%
- Grape..... 40&10@50%
- Tree Pruners..... 75%

Nagley's Pruning Shears..... 10&5%
Nagley's Tobacco Shears... ₱ doz. 15.00
P., S. & W. Co..... 33⅓%

## Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller Hatfield's, Sargent's list, ..... 70&10%
Reading..... 70&10@75%
P. & F. H. ..... 33⅓%
Wrightsville Hatfield Pattern..... 80%

### Sliding Shutter—
Reading list.....70&10@75%
R. & E. list.....34½%
Sargent's list.....50&10%

### Shells—Shells, Empty—
Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 13 and 20 gauge.....25%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%

### Shells, Loaded—
*Loaded with Black Powder*.....40%
*Loaded with Smokeless Powder, medium grade*.....40&5%
*Loaded with Smokeless Powder, high grade*.....40&10&10%

### Shoes Horse, Mule, &c.—
*F. o. b., Pittsburg:*
*Iron*.....*per keg $3.85*
*Steel*.....*per keg 3.60*
Burden's, all sizes, ₱ keg.....$3.90

### Shot—
*Drop, up to B, 25-lb. bag*.....$1.35
*Drop, B and larger, per 25-lb. bag*$1.60
*Buck, 25-lb. bag*.....$1.60
*Chilled, 25 lb. bag*.....$1.60
*Dust Shot, 25-lb. bag*.....$2.10
Markle's Chilled.....$1.90
Raymond Chilled——.....$1.80
Sparks, Chilled.....$1.60
Tatham's Chilled.....$1.60

### Shovels and Spades—
*Association List, Nov. 15, 1902*....40%

### Sieves and Sifters—
*Hunter's Imitation, gro. $11.00@11.50*
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

| 14&16 | 16&18 | 18&20 |
|---|---|---|
| $12.90 | $13.80 | $15.00 |

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00.....20%

### Sieves, Tin Rim—
*Per dozen*

| *Mesh* | 14 | 16 | 13 | 20 |
|---|---|---|---|---|
| *Black, full size* | $1 20 | 1.25 | 1.30 | 1.35 |
| *Plated, full size* | 1.30 | 1.35 | 1.40 | 1.45 |
| *Black, scant* | .... | $0.95 | 1.00 | 1.05 |

### Sieves, Wooden Rim—
*Nested, 10, 11 and 12 Inch.*
*Mesh 18, Nested, doz*.....$0.65@0 75
*Mesh 20, Nested, doz*..... .75@ .85
*Mesh 24, Nested, doz*..... .90@1.00

### Sinks—
#### Cast Iron—
*Standard list*.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

### Skeins Wagon—
*Cast Iron*.....70@70&10%
*Malleable Iron*.....40&10@50%
*Steel*.....40@40&10%

### Slates, School—
*Factory Shipments.*
*"D" Slates*.....45%
*Noiseless Slates*.....60&¼ *tens &5%*
*Wire Bound*.....50%

### Slaw Cutters—See *Cutters.*

### Slicers, Vegetable—
Sterling No. 10, $2.00.....33⅓

### Snaps, Harness—
*German*.....40@40&10%
Covert Mfg. Co.:
Derby.....3&2%
High Grade.....45&2%
Jockey.....4&2%
Trojan.....45&2%
Yankee.....35&2%
Yankee, Roller.....30&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....45%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded.....66⅔&10%

### Snaths—
*Scythe*.....50@50&10%

### Snips, Tinners'—See *Shears.*

### Soldering Irons—
See *Irons, Soldering.*

### Spoke Trimmers—
See *Trimmers, Spoke.*

### Spoons and Forks—
#### Silver Plated—
*Good Quality*.....50&10@60&10&5%
*Cheap*.....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

### Miscellaneous—
*German Silver*.....60@60&10%
Castaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1 &10%

### Tinned Iron—
*Teas*.....*per gro. 45@5oc*
*Tables*.....*per gro. 90c@$1.00*

### Springs—Door—
Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

### Carriage, Wagon, &c.
*1¼ in. and Wider:*
*Black or ⅛ Bright, lb*.....5¼c
*Bright, lb*.....5½c
*Painted Seat Springs:*
*1½ x 2 x 26, per pr*.....55@55c
*1½ x 2 x 28 per pr*.....60@65c
*1½ x 3 x 28 and narrower, per pr*. 80@85c
Cliff's Springs:
Bolster.....40%
Seat.....per pair 50c
Pole per pair, ⅝ in. $1.10; ¾ in. $1.25

### Sprinklers, Lawn—
Enterprise.....25@20%
Mackney.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

### Squares—
*Nickel plated*.... } *List Jan. 5, 1900*
*Steel and Iron*,.. } ..... 70&10%
*Rosewood hdl Try Square and T-Bevels*.....60&10&10@70%
*Iron Hdl. Try Squares and T-Bevels.*
50&10@50&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter.....
40&10&40&10&10%

### Squeezers—Lemon—
*Wood, Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.*
*Wood, Porcelain Lined,*
*Cheap*.....*doz. $2.00@2.75*
*Good Grade*.....*doz. $3.00@3.50*
*Tinned Iron*.....*doz. $0.75@1.25*
*Iron, Porcelain Lined doz. $2.90@3.25*

### Staples—
*Barbed Blind*.....*lb. 6@7½c*
*Electricians', Association list*.....
40&10&10&10%
*Fence Staples, See Trade Report.*
*Galvanized, 10c less than Barb Wire*
*Polished 20c less than Barb Wire.*
*Poultry Netting, Staples....per lb.*
5½@7½c
Grand Crossing Tack Co.'s list.....80&10%

### Steels, Butchers'—
Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....30&5%
C. & A. Hoffmann's.....40%

### Steelyards.....25&10@30&10%

### Stocks and Dies—
*Blacksmiths'*.....*50&10@50%*
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

### Stone—
#### Scythe Stones—
Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.50
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S. ₱ gro. $7.00
No. 2 Indian Pond S. S. ₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓%
#### Oil Stones, &c.
Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....5%
Gem Corundum Axe, Single or Double Grit.....35%
Gem Corundum Slips.....65%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

| | ₱ lb. |
|---|---|
| Arkansas Stone, No. 1, 3 to 5 in. | $2.50 |
| Arkansas Stone, No. 1, 5 to 8 in. | 3.50 |
| Arkansas Slips No. 1 | 4.00 |
| Lily White Washita 4 to 8 in | 60c |
| Rosy Red Washita 4 to 8 in | 60c |
| Washita Stone, Extra, 4 to 8 in. | 50c |
| Washita Stone, No. 1, 4 to 8 in. | 40c |
| Washita Stone, No. 2, 4 to 8 in. | 30c |
| Lily White Slips | 90c |
| Rosy Red Slips | 90c |
| Washita Slips, Extra | 80c |
| Washita Slips, No. 1 | 70c |
| India Oil Stones (entire list) | 25% |
| Hindostan No. 1, Regular | ₱ lb 8c |
| Hindostan No. 1 Small | ₱ lb 10c |
| Axe Stones (all kinds) | 33⅓% |
| Turkey Oil Stones, ex. 5 tos in. | ₱ lb 80c |
| Queer Creek Stones, 4 to 8 in. | 30c |
| Queer Creek Slips | 40c |
| Sand Stone | 5c |
| Belgian, German and Swaty Razor Hones | 40% |
| Natural Grit Carving Knife Hones, ₱ doz | $8.00 |
| Quick Edge Pocket Knife Hones, ₱ doz | $3.00 |
| Mounted Kitchen Sand Stone, ₱ doz | $1.50 |

33⅓%

### Stoners—Cherry—
Enterprise.....25@30%

### Stops Bench—
Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

### Plane—
Chapin-Stephens Co.....20%

### Window—
Ives' Patent.....25&5%

### Stove Boards—
See *Boards, Stove.*

### Stove Polish—See *Polish, Stove.*

### Straps—Box—
Carr's Universal, case lots.....20&10%

### Hame—
Covert's Saddlery Works.....40&10%

### Stretchers, Carpet—
*Cast Iron, Steel Points*...*doz. 55@60c*
*Socket*.....*doz. $1.75*

### Stuffers Sausage—
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

### Supports, Porch—
Hoffman's Porch Supports....₱ doz. 25c

### Sweepers, Carpet—
National Sweeper Co.: Per doz
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel.....$27.00
Monarch, Roller Bearing, Nickel..$22.00
Monarch, Roller Bearing, Japanned.$22.00
Marion Queen, Roller Bearing, Regular Finishes, full Nickel.....$24.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$33.00
Perpetual, Regular Bearings, Nkl.$30.00
Perpetual, Regular Bearings, Jap.$27.00
NOTE.—*Discount of 30c per dozen on three dozen lots. Discount of $1 per dozen on five dozen lots.*

### Tacks Brads, &c.—
*List Jan. 15, '99.*
*Carpet Tacks, American*.....
*90c&25c&5@*....%
*American Cut Tacks*.*90c&20c&5@*....%
*Swedes Iron Tacks*...*90c30c&5@*....%
*Swedes Upholsterers' Tacks*.....
*90c&5c&10c&5@*....%
*Gimp Tacks*.....*90c&5c&5@*....%
*Lace Tacks*.....*90c&40@*....%
*Trimmers' Tacks*..*90c&30c&10c&5@*....%
*Looking Glass Tacks*....*70c&10@*....%
*Bill Posters' and Railroad Tacks*....
*90c&5c&5@*....%
*Hungarian Nails*...*80c&0c&5@*....%
*Common and Patent Brads*....*80c&10%*
*Trunk and Clout Nails*..*80c&5@*....%
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&2½% on Standard Weights.****

### Miscellaneous—
*Double Point Tacks*.....*90 and 5 tens*
*Steel Wire Brads, R. & E. Mfg. Co.'s list*.....*50c&10@60%*
See also *Nails, Wire.*

### Tanks, Oil—

| | Each. |
|---|---|
| Emerald, S. S. & Co.....30-gal | $3.40 |
| Emerald, S. S. & Co.....60-gal. | $4.25 |
| Queen City S. S. & Co., 30-gal. | $3.45 |
| Queen City S. S. & Co., 60-gal. | $4.50 |

### Tapes, Measuring—
*American Asses' Skin*.....*40c&10@50%*
*Patent Leather*.....*25@30c&5%*
*Steel*.....*40@40c&5%*
*Chesterman's*.....*25@25c&5%*
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

### Teeth, Harrow—
*Steel Harrow Teeth, plain or headed, ¾ inch and larger, per 100 lbs. $2.35c*

### Thermometers—
*Tin Case*.....*80c&10@80c&10c&5%*

### Ties, Bale—Steel Wire.
*Single Loop*.....*80@80c&10%*
*Improved, Monitor, Cross Head, Etc*.....70%

### Ties, Wall—
Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6½ in. ₱ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000..$11.00
Galv. Steel 5-32 x 11½ in. ₱ 1000..$12.00
Galv. Steel 5-32 x 15½ in. ₱ 1000..$14.00

### Tinners' Shears, &c.—
See *Shears. Tinners', &c.*

### Tinware—
Stamped, Japanned and Pieced, sold very generally at net prices.

### Tips, Safety Pole—
Covert's Saddlery Works.....60&10%

### Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

### Tobacco Cutters—
See *Cutters, Tobacco.*

### Tools—Coopers'—
L. & I. J. White.....20@20&5%

### Saw—
Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

### Ship—
L. & I. J. White.....25%

### Transom Lifters—
See *Lifters, Transom.*

### Traps—Fly—
*Balloon, Globe or Acme*.....
*doz. $1.15@1.25; gro. $11.50@12.00*
*Harper, Champion or Paragon*....
*doz. $1.25@1.50; gro. $13.00@15.50*

### Game—
*Oneida Pattern*.....*80@80c&5%*
Newhouse.....45@45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....60&5@60&10%

### Mouse and Rat—
*Mouse, Wood, Choker, doz. holes*....
*8½@9c*
*Mouse, Round or Square Wire*.....
*doz. 85@90c*
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₱ doz. $4.50; in ½ gro. lots, ₱ doz.....$4.90
No. 2, Detroit Marty Pattern, ₱ doz. $3.25; in ½ gro. lots, ₱ doz.....$3.90
Detroit Marty Pattern Mouse, ₱ doz. $2.00; in ½ gro. lots, ₱ doz.... $1.75
Eli Mouse Traps.....per doz. 40c
Eli Rat Traps.....per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½;..₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00.....50%
J. M. Mast Mfg. Co.:

| | Per gro. Mouse. | Rat |
|---|---|---|
| Blizzard | No. 12, $3.00 | No. 1, $9 50 |
| Old Nick | No. 30, 2.22 | No. 2, 8.40 |
| Joker | No. 5, 2 10 | No. 3, 8.40 |

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4 20.

### Target—
Markle's, each.....$5.50

### Trimmers Spoke—
Bonney's Nos. 1 and 2.....40%
Wood's K 1.....50%

### Trowels—
Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Never-Break Steel Garden Trowels, gro. $6.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering...25%

### Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....per doz. $16.00
Grocery.....per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks.....₱ doz. $18.50

### Tubs, Wash—

| | *No. 1* | 2 | 3 |
|---|---|---|---|
| *Galvanized, per doz.* | $4.75 | 5 25 | 6.00 |

Galvanized Wash Tubs (S. S. & Co.):

| No. | 1 | 2 | 3 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|
| Per doz. | $5.25 | 6.00 | 6.75 | 6.50 | 7.00 | 8.00 |

### Twine—Miscellaneous—

| *Flax Twine*— | *BC* | *B.* |
|---|---|---|
| *No. 9, ¼ and ½-lb. Balls* | 21½c | 23½c |
| *No. 12, ¼ and ½ lb. balls* | 17½c | 19½c |
| *No. 18, ¼ and ½-lb. Balls* | 15½c | 17½c |
| *No. 24, ¼ and ½-lb. Balls* | 15 c | 17 c |
| *No. 36, ¼ and ½-lb. Balls* | 14½c | 16½c |

*Chalk Line, Cotton, ½-lb Balls*.....
*22@22½c*
*Cotton Mops, 6, 9, 12 and 15 lb. to*
*doz*.....*8c*
*Cotton Wrapping 5 Balls to lb*..
*according to quality*.....*11c@17c*
*American 2-Ply Hemp, ¼ and ½-lb. Balls*.....*13@14c*
*American 3 Ply Hemp, 1-lb. Balls*..
*13@14c*
*India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)*.....*8c*
*India 3-Ply Hemp, 1-lb. Balls*.....*8c*
*India 3-Ply Hemp, 1½-lb. Balls*.....*7c*
*2, 3, 4 and 5-Ply Jute, ½-lb. Balls*...
*8@9c*
*Mason Line, Linen, ½-lb. Balls*...*45c*
*No. 264 Mattress, ¼ and ½-lb. Balls.37c*
*Wool, 3 to 6 ply*.....*5@5½c*

## Vises—
*Solid Box*.....*50c&5@40&10%*

### Parallel—
Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Key-stone.....65&5%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's:
Clincher.....30@40%
Combination, Quick Adj.....40%
Woodworker's.....15%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Smith & Hemenway Co.:
Machinists.....40%
Jewelers.....33⅓%
Snediker's X. L.....33⅓%
Stephens'.....33⅓%

### Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 ..50&5%
Disston's D 3 Clamp and Guide, ₱ doz $30.....25%
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

### Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

### Miscellaneous—
Bignall & Keeler Combination Pipe Vise.....60%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

## Wads—Price Per M.

| | |
|---|---|
| *B. E., 11 up*.....*60c* | |
| *B. E., 9 and 10*.....*70c* | |
| *B. E., 8*.....*80c* | |
| *B. E., 7*.....*80c* | |
| *P. E., 11 up*.....*$1.00* | |
| *P. E., 9 and 10*.....*1.25* | |
| *P. E., 8*.....*1.50* | |
| *P. E., 7*.....*1.50* | |
| *Ely's B. E., 11 and larger*..*$1.70@1.75* | |
| *Ely's P. E., 12 to 20*.....*$3.00@3.25* | |

*Dis. 15%*

**Wagon Jacks—**
See *Jacks, Wagon.*

**Ware Hollow—**
**Cast Iron, Hollow—**
*Stove Hollow Ware:*
*Ground*.....60%
*Unground*.....65%
*White Enameled Ware:*
*Maslin Kettles*.....70%
*Covered Ware:*
*Tinned and Turned*.....40%
*Enameled*.....50%
See also *Pots Glue.*

**Enameled—**
Agate Nickel Steel Ware, list Nov. 1, '01.....50&5%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

**Tea Kettles—**
*Galvanized Tea Kettles:*

| *Inch* | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| *Each* | 45c | 50c | 55c | 65c |

**Steel Hollow Ware.**
Avery Spiders & Griddles.....65c@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%

**Warmers, Foot—**
Pike Mfg. Co., Soapstone.....40@40&10%

**Washboards—**
Solid Zinc: ₱ doz
Crescent, family size, bent frame.$3.00
Red Star, family size, stationary protector.....$3.00
Double Zinc Surface:
Saginaw Globe family size, stationary protector.....$2.65
Cable Cross, family size, stationary protector.....$2.90
Single Zinc Surface:
Naiad, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25
Brass Surface:
Brass King, Single Surface, open back.....$3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface.....$3.00

**Washers—**
**Leather, Axle—**
*Solid*.....85c@1.10@85c@1.10@1.10@1.10
*Patent*.....85c@1.00@85c@1.20%
*Coil:* 3/8 | 1 | 1¼ | 1¾ Inch.
15c | 10c | 11c | 15c per 100

**Iron or Steel—**

| *Size bolt* | 5-16 | 3/8 | ½ | 5/8 | ¾ |
|---|---|---|---|---|---|
| *Washers* | $6.60 | 5.70 | 4.40 | 4.20 | 4.00 |

*In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.*

**Cast Washers—**
*Over ½ inch, barrel lots, per lb.*.....1½@1¾c

**Washer Cutters—**
See *Cutters, Washer.*

**Washing Machines—**
See *Machines, Washing.*

**Water Coolers—**
See *Coolers, Water.*

**Wedges—**
*Oil Finish*.....*lb.* 2.90@3.10c

**Weights**

**Hitching—**
Covert's Saddlery Works.....60&10%

**Sash—**
*Per ton, f.o.b. factory:*
*Eastern District*.....$25.00
*Western, Central and Southern Districts*.....$27.00

**Well Buckets, Galvanized**
See *Pails, Galvanized.*

**Wheels, Well—**
*8-in., $1.6 @1.80; 10-in., $2.00@2.25; 12-in., $2.15@2.65; 14-in., $3.00@4.25*

**Wire and Wire Goods—**
*Bright and Annealed:*
*6 to 9*.....72½@75@72½&10%
*10 to 18*.....72½@10@72½@10@75%
*19 to 26*.....75@10@72½@75@10@72½%
*27 to 36*.....75@10@72½@80@2½%
*Galvanized:*
*6 to 18*.....70@70@75%
*19 to 26*.....72½@75@72½@10%
*27 to 36*.....72½@10@72½@10@75%
*Coppered:*
*6 to 9*.....70@75@70@1%
*10 to 18*.....70@10@70@10@75%
*19 to 26*.....75@75@75@10@72½%
*27 to 36*.....75@10@75@10@75%
*Tinned:*
*6 to 14*.....75@75@72½%
*15 to 18*.....72½@75@72½%
*19 to 26*.....70@75@70@72½%
*27 to 36*.....70@70@75%
*Annealed Wire on Spools*...70@70@75%
*Brass and Copper Wire on Spools*, 60@60@75%
*Brass, list Feb. 26, '96*.....25%
*Copper, list Feb. 26, '96*.....15%
*Cast Steel Wire*.....50%
*Stubs' Steel Wire*.....$6.00 to 2.40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

**Bright Wire Goods—**
*List April 1, 1901*..85c@10@85c@10@10%

**Wire Cloth and Netting—**
*Galvanized Wire Netting*.....80@10@80@17½%
*Painted Screen Cloth per 100 ft*.....$1.10@1.15
*Light Hardware Grade:*
*2-8 Mesh, Plain (8c. list) sq. ft*...1¾@2c
*2-8 Mesh, Galv. (8c. list) sq ft*..2½@2¾c

**Wire, Barb—**See *Trade Report.*
**Wire Rope—**See *Rope, Wire.*

**Wrenches—**
*Agricultural*.....75&5@75c@10c@5%
*Baxter Pat'rn S Wrenches*.70@70c@5%
*Drop Forged S*.....45@45c@5%
Acme.....60&10%
Alligator.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable & Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Boardman's.....33⅓%
Coes' Genuine.....40&10&5&5%
Coes' "Mechanics".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Dudly Auto.....50&5@50&10%
Eagle.....50&10%
Elgin Wrenches.....40%
Elg'n Monkey Wrench Pipe Jaws...33⅓%
Gem Pocket.....30%
Hercules.....70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....50%
Solid Handles, P.S. & W.....50@50&5%
Stillson.....65%
Triumph.....60&10%
Vulcan Chain.....50%

**Fruit Jar—**
Perfection Fruit Jar Wrenches, ₱ gro.$6
Triumph Fruit Can Wrenches, Jobbers, ₱ gro..$7.50; Retailers, $9.60.
Triumph Fruit Jar Holders, Jobbers, ₱ gro., $12.00; Retailers, $15.00.

**Wrought Goods—**
*Staples, Hooks, &c., list March 17 '96*.....90@90c&5%

**Yokes Neck—**
Covert Saddlery Works, Trimmed...70%
Covert Saddlery Works, Neck Yoke Centers.....70%

**Yokes, Ox, and Ox Bows—**
Fort Madison's Farmers & Freighters'.. list net

**Zinc—**
*Sheet*.....*lb* 6½c@6¾c

# PAINTS, OILS AND COLORS—Wholesale Prices.

**White Lead, Zinc, &c.**
Lead, English white, in Oil.. .. 7½@ 9⅜
Lead, American White, in Oil:
Lots of 500 ℔ or over.....@ 6
Lots less than 500 ℔.....@ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....@ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price..@ 1½
Lead White, Dry in bbls.....5½@ 6
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....₱ ℔ 4¾@ 4¾
Zinc, Paris, Red Seal, dry.....@ 8½
Zinc, Paris, Green Seal, dry.....@ 9⅜
Zinc, Antwerp Red Seal, dry.....@ 6½
Zinc, Antwerp, Green Seal, dry..@ 8¾
Zinc, V. M. French. In Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11½
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

**Dry Colors.**
Black, Carbon.....₱ ℔ 5 @ 8
Black, Drop, Amer.....4 @ 7
Black, Drop, Eng.....7 @11
Black, Ivory.....12 @21
Lamp, Com.....4½@ 6
Blue, Celestial.....₱ ℔ 4 @ 6
Blue, Chinese.....30 @35
Blue, Prussian.....28 @34
Blue, Ultramarine.....3 @12
Brown, Spanish.....1½@ 1
Brown, Vandyke, Amer.....1¾@ 2½
Brown, Vandyke, Foreign.....2½@ 3
Carmine, No. 40.....₱ ℔ $3.05@3.75
Green, Chrome, ordinary.....5 @ 6½
Green, Chrome, pure.....19 @26
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 5½
Lots less than 500 ℔.....@ 6
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over.....@ 5½
Lots less than 500 ℔.....@ 6
Ocher, French Washed.....1¾@ 1¾
Ocher, Dutch Washed.....4¾@ 5
Ocher, American.....₱ ton $10.00@15.00
Orange Mineral, English..₱ ℔ 8@@ 8½
Orange Mineral, French.....11¾@ 12
Orange Mineral, German.....8½@9½
Orange Mineral, American.....7¾@ 8
Red, Indian, English.....4½@ 8½
Red, Indian, American.....3 @ 3¼
Red, Turkey, English.....4 @ 6
Red, Tuscan, English.....7 @10
Red, Venetian, Amer..₱ 100 ℔. .50@1.50
Red Venetian, English.₱ 100 ℔.1.80@2.00
Sienna, Italian, Burnt and Powdered.....₱ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd.....3½@ 7½
Sienna, American, Raw.....1½@ 3
Sienna, American, Burnt and Powdered.....₱ ℔ 1½@ 2
Talc, French.....₱ 100 ℔ $1.25 @1.50
Talc, American.....80 @1.10
Terra Alba, French, ₱ 100 ℔ .95 @1.00
Terra Alba, English.....95 @1.00
Terra Alba, American No. 1....85 @85
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow.₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer.....1½@ 2
Umber, Raw, Amer.....1½@ 2
Yellow, Chrome.....10½@25
Vermilion, American Lead.....10 @10
Vermilion, Quicksilver, bulk...@70
Vermilion, Quicksilver, bags...@71
Vermilion, English, Import...80 @95
Vermilion, Chinese.....$1.05@1.20

**Colors in Oil.**
Black, Lampblack.....12 @14
Blue, Chinese.....36 @40
Blue, Prussian.....32 @35
Blue, Ultramarine.....13 @16
Brown, Vandyke.....9½@13
Green, Chrome.....10 @12
Green, Paris.....@24
Sienna, Raw.....10 @13
Sienna, Burnt.....10 @13
Umber, Raw.....9½@12
Umber, Burnt.....9½@12

**Miscellaneous.**
Barytes, Foreign, ₱ ton.....$19.00@21.00
Barytes, Amer. floated.....19.00@20.00
Barytes, Crude, No. 1.....9.00@10.00
Chalk, in bulk.....₱ ton 2.50@ 2.60
Chalk, in bbls.....₱ 100 ℔ ..@ 35
China Clay, English..₱ ton 12.00@17.50
Cobalt, Oxide.....₱ 100 ℔ 2.25@ 2.50
Whiting, Common ₱ 100 ℔ .40@ .60
Whiting, Gilders.....45@@ .65
Whiting, extra Gilders'.... .55@ .58

**Putty.**
In bladders.....$2.25
In bulk.....2.25
In cans 1 ℔ to 5 ℔.....3.25
In cans 12 ℔ to 25 ℔.....2.25

**Spirits Turpentine.**
In Southern bbls.....56 @56½c
In machine bbls.....61½@57

**Glue.**
Cabinet.....₱ ℔ 11½@16
Extra White.....18 @23
French.....12 @40
Irish.....13½@16
Low Grade.....9 @12
Medium White.....14½@16½

**Animal, Fish and Vegetable Oils.**
Linseed, City, raw.....₱ gal..46 @47
Linseed, City, boiled.....48 @49
Linseed, State and West'n, raw 45 @47
Linseed, raw Calcutta seed.....@75
Lard, Prime.....87 @88
Lard, Extra No. 1.....65 @68
Lard, No. 2.....52 @56
Cotton-seed, Crude.....34 @35
Cotton-seed, Summer Yellow, prime.....39½@40
Cotton-seed Summer Yellow, off grades.....37½@38
Sperm, Crude.....@
Sperm, Natural Spring.....71 @73
Sperm, Bleached Spring.....74 @76
Sperm, Natural Winter.....75 @77
Sperm, Bleached Winter.....78 @80
Tallow, Prime.....@3 @4
Whale, Crude.....@
Whale, Natural Winter.....46 @47
Whale, Bleached Winter.....48 @49
Menhaden, Crude, Sound.....@
Menhaden, Light Strained.....32 @33
Menhaden, Bleached Winter..34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon.....@6½@ 6¾
Cocoanut, Cochin.....7½@ 7¾
Cod, Domestic.....33 @35
Cod, Newfoundland.....36 @37
Red Elaine.....48 @49
Red Saponified.....₱ ℔ 6½@ 6½
Olive, Italian, bbls.....58 @ 58
Neatsfoot, prime.....55 @56
Palm, prime, Lagos.....₱ ℔ 5½@ 6

**Mineral Oils.**
Black, 20 gravity, 25@30 cold test.....₱ gal. 10½@12
Black, 29 gravity, 15 cold test. 11½@12
Black, summer.....10 @11½
Cylinder, light filtered.....15½@18½
Cylinder, dark filtered.....14½@17
Paraffine, 903-907 gravity.....12½@13
Paraffine, 903 gravity.....11½@12
Paraffine, 883 gravity.....9½@10½
Paraffine, red, No. 1.....12½@13
In small lots ½c advance.


# THE IRON AGE

*The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.*

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# CURRENT METAL PRICES.

## JANUARY 7, 1902.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

### IRON AND STEEL—

#### Bar Iron from Store—

| | Cts ₱ lb. |
|---|---|
| Refined Iron: 1 to 1¾ in. round and square; 1½ to 4 in. x ⅝ to 1 in.; 1½ to 4 in. x ⅛ to 5-16 | ₱ lb 2.15@2.20¢ |
| Rods—⅜ and 11-16 round and square | ₱ lb 2.40@2.50¢ |
| Angles: | |
| 3 in x ¼ in and larger | 2.50¢ |
| 3 to 3½ in. x 3-16 in | 2.75¢ |
| 1½ to 3 in. x ¼ in | 2.75¢ |
| 1½ to 2¾ in. x 3-16 in and thicker | 2.50¢ |
| 1 to 1¼ in. x 3-16 in | 2.55¢ |
| 1 to 1¼ x ¼ in | 2.50¢ |
| ⅞ x ¼ in | 2.70¢ |
| ⅝ x ¼ in | 2.80¢ |
| ⅝ x ½ in | 3.70¢ |
| ½ x 3-32 in | 4.20¢ |
| Tees: | |
| 1 in | 3.00¢ |
| 1¼ in | 2.80¢ |
| 1½ in. and larger | 2.75¢ |
| Beams | 2.50@3.00¢ |
| Channels, 3 in. and larger | 2.50@3.00¢ |
| Bands—1½ to 6 x 3-16 to No. 8 | ₱ lb 2.50¢ |
| "Burden's Best" Iron, base price | ₱ lb 3.30¢ |
| Burden's "H. B. & S. Iron, base price | ₱ lb 3.10¢ |
| "Ulster" | ₱ lb 3.15¢ |
| Norway Bars | 3.75@4.25¢ |
| Norway Shapes | 4.00@4.50¢ |

#### Merchant Steel from Store—

| | per lb |
|---|---|
| Bessemer Machinery | 2.10 to 2.20¢ |
| Toe Calk, Tire and Sleigh Shoe | 2.30@3.00¢ |
| Best Cast Steel, base price in small lots | 7½¢ |

#### Soft Steel Sheets—

| | | | |
|---|---|---|---|
| ¼ inch | 2.50¢ | No. 14 | 2.90¢ |
| 3-16 inch | 2.60¢ | No. 16 | 3.00¢ |
| No. 8 | 2.65¢ | No. 18 | 3.30¢ |
| No. 10 | 2.70¢ | No. 20 | 3.80¢ |
| No. 12 | 2.80¢ | No. 22 | 3.40¢ |

#### Sheet Iron from Store.

##### Black.

| | One Pass, C. R. Soft Steel | R. G. Cleaned |
|---|---|---|
| Nos. 14 to 16 | ₱ lb, 2.90 | 3.10¢ |
| Nos. 18 to 21 | ₱ lb, 3.00 | 3.20¢ |
| Nos. 22 to 24 | ₱ lb, 3.10 | 3.30¢ |
| Nos. 25 and 26 | ₱ lb, 3.20 | 3.40¢ |
| No. 27 | ₱ lb, 3.30 | 3.50¢ |
| No. 28 | ₱ lb, 3.40 | 3.60¢ |

#### Russia, Planished, &c.

| | |
|---|---|
| Genuine Russia, according to assortment | ₱ lb 11¾@14¢ |
| Patent Planished—₱ lb A, 11¢; B, 10¢, net. | |

#### Galvanized.

| | |
|---|---|
| Nos. 14 to 16 | ₱ lb, 3.10@3.15¢ |
| Nos. 18 to 20 | ₱ lb, 3.35@3.40¢ |
| Nos. 22 to 24 | ₱ lb, 3.65@3.70¢ |
| No. 26 | ₱ lb, 3.90@3.95¢ |
| No. 27 | ₱ lb, 4.20@4.35¢ |
| No. 28 | ₱ lb, 4.50@4.55¢ |
| No. 30 | ₱ lb, 5.65@5.70¢ |

No. 20 and lighter, 36 inches wide, 25¢ higher.

#### Foreign Steel from Store—

| | |
|---|---|
| Best Cast | ₱ lb 15 ¢ |
| Extra Cast | ₱ lb 18 @ 20 ¢ |
| Swaged, Cast | ₱ lb 16 ¢ |
| Best Double Shear | ₱ lb 15 ¢ |
| Blister, 1st quality | ₱ lb 13 ¢ |
| German Steel, Best | ₱ lb 10 ¢ |
| 2d quality | ₱ lb 9 ¢ |
| 3d quality | ₱ lb 8 ¢ |
| Sheet Cast Steel, 1st quality | ₱ lb 15 ¢ |
| 2d quality | ₱ lb 14 ¢ |
| 3d quality | ₱ lb 12 ¢ |
| R. Mushet's "Special" | ₱ lb 46 ¢ |
| " " " Annealed | ₱ lb 75 ¢ |
| " " "Titanic" | ₱ lb 19 ¢ |
| Hobson's Choice XX Extra Best | ₱ lb 35 ¢ |
| Jessop Self Hardening | ₱ lb 45 ¢ |
| Seamans'" Nelson" Steel | 40 ¢ |
| Hobson's "Soho" Special Self-Hardening | ₱ lb 43 ¢ |

### METALS—

#### Tin—

| | Per ₱ |
|---|---|
| Duty.—Pigs, Bars and Block. Free. | |
| Banca, Pigs | 26½@27 ¢ |
| Straits, Pigs | 26½@27 ¢ |
| Straits in Bars | 27½@28 ¢ |

#### Tin Plates—

##### American Charcoal Plates.

| | |
|---|---|
| Calland Grade: IC, 14 x 20 | $6.25 |
| IX, 14 x 20 | 7.75 |
| Melyn Grade: IC, 14 x 20 | 5.75 |
| IX, 14 x 20 | 7.25 |
| Allaway Grade: IC, 14 x 20 | 5.25 |
| IX, 14 x 20 | 6.35 |

##### American Coke Plates—Bessemer—

| | |
|---|---|
| IC, 14 x 20 ..... 108 ₱ | $4.50@4.80 |
| IX, 14 x 20 | $5.70@5.75 |

##### American Terne Plates—

| | |
|---|---|
| IC, 20 x 28 | $9.00 |
| IX, 20 x 28 | $11.00 |

#### Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₱ lb.

#### Ingot—

| | |
|---|---|
| Lake | 12¾¢ |
| Casting | 12 ¢ |

#### Sheet and Bolt—

February 2, 1902. Net.

Prices, in cents per pound. Sheet 30 x 60.

| No. ... than. | Not longer than | And longer than | 64 oz. & over, 6/lb. sheet, 30 x 60 and heavier. | 32 oz. to 64 oz. 25 to 30 lb. | 24 oz. to 32 oz. 18¾ to 25 lb. | 16 oz. to 24 oz. 12½ to 18¾ lb. | 14 oz. and 15 oz. 11 to 12½ lb. | 12 oz. and 13 oz. 9½ to 11 lb. | 10 oz. and 11 oz. 7½ to 9½ lb. | 8 oz. and 9 oz. 6¼ to 7½ lb. | Lighter than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ins. | Ins. | Ins. | | | | | | | | | |
| 30 | 72 | ..... | 18 | 18 | 18 | 18 | 19 | 20 | 21 | 24 | 27 |
| 30 | 96 | 72 | 18 | 18 | 18 | 18 | 19 | 21 | 24 | 27 | |
| 30 | ..... | 96 | 18 | 18 | 18 | 18 | 20 | 24 | 27 | | |
| 36 | 72 | ..... | 18 | 18 | 18 | 18 | 20 | 22 | 25 | 28 | |
| 36 | 96 | ..... | 18 | 18 | 18 | 18 | 20 | 24 | 27 | | |
| 36 | 120 | 96 | 18 | 18 | 18 | 19 | 21 | 27 | | | |
| 36 | ..... | 120 | 18 | 18 | 19 | 20 | 27 | | | | |
| 48 | 72 | ..... | 18 | 18 | 19 | 20 | 22 | 25 | 28 | | |
| 48 | 96 | 72 | 18 | 18 | 19 | 21 | 23 | 25 | | | |
| 48 | 120 | 96 | 18 | 18 | 20 | 22 | 26 | | | | |
| 48 | ..... | 120 | 18 | 19 | 21 | 24 | | | | | |
| 60 | 72 | ..... | 18 | 18 | 19 | 21 | 24 | 29 | | | |
| 60 | 96 | 72 | 18 | 18 | 20 | 22 | 27 | | | | |
| 60 | 120 | 96 | 18 | 19 | 21 | 24 | | | | | |
| 60 | ..... | 120 | 18 | 20 | 22 | 27 | | | | | |
| 72 | 96 | ..... | 18 | 19 | 21 | 25 | | | | | |
| 72 | 120 | 96 | 19 | 20 | 23 | 28 | | | | | |
| 72 | ..... | 120 | 19 | 21 | 25 | | | | | | |
| 108 | 96 | ..... | 19 | 21 | 24 | | | | | | |
| 108 | 120 | 96 | 20 | 22 | 25 | | | | | | |
| 108 | ..... | 120 | 21 | 23 | 27 | | | | | | |
| wider than 108 | 132 | ..... | 22 | 24 | | | | | | | |
| | ..... | 132 | 24 | 23 | | | | | | | |

Rolled Round Copper, ⅜ inch diameter and over, ₱ lb 1¢.

Circles, Segments and Pattern Sheets, 3¢ ₱ lb advance over price of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₱ square foot and heavier, 1¢ ₱ lb over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₱ square foot, 2¢ ₱ lb over the foregoing prices.

All Polished Copper, 20 in. wide and under 1¢ ₱ lb advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₱ lb advance over the price for Cold Rolled Copper.

#### Planished Copper—

1¢ ₱ lb more than Polished Copper.

#### Copper Bottoms, Pits and Flats—

| | |
|---|---|
| 14 oz. to square foot and heavier, ₱ lb | 22¢ |
| 12 oz. and up to 14 oz. to square foot, ₱ lb | 23¢ |
| 10 oz. and up to 12 oz., ₱ lb | 25¢ |
| Lighter than 10 oz., ₱ lb | 28¢ |

Circles less than 8 in. diameter, 2¢ ₱ lb additional

Circles over 13 in. diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1¢ ₱ lb extra.

#### Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

*List Feb. 20, 1901.*

| Nos. | 0000 to 3 Base | 2 and 1 | 0 | 00 | 000 | 0000 |
|---|---|---|---|---|---|---|
| | ¼¢ | ½¢ | ¾¢ | 1¢ | 1¼¢ | 1½¢ adv. |
| Nos. | 4 | 5 | 6 | 7 | 8 | 9 |
| | 1¾¢ | 2¢ | 2¼¢ | 2½¢ | 2¾¢ | 3¢ adv. |
| Nos. | 10 | 11 and 12 | 13 | 14 | 15 | 16 |
| | 3¼¢ | ½¢ adv. | ¾¢ adv. | 1¢ adv. | 1¼¢ adv. | 1½¢ adv. |

#### Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net.

| Stubs' W. G. | B. & S. W. G. | Outside Diameter. 5-16 | ⅜ | 7-16 | ½ | 9-16 | ⅝ | ¾ | ⅞ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-11 | 3- 9 | ..... | ..... | ..... | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 12 | 10 | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 13 | 11 | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 14 | 12 | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 15 | 13 | 42 | 38 | 36 | 33 | 32 | 31 | 30 | 29 | 28 | 26 | 25 |
| 16 | 14 | 43 | 39 | 37 | 34 | 33 | 32 | 31 | 30 | 29 | 26 | 25 |
| 17 | 15 | 44 | 40 | 38 | 35 | 34 | 33 | 32 | 31 | 30 | 27 | 26 |
| 18 | 16 | 61 | 46 | 42 | 39 | 36 | 35 | 34 | 33 | 31 | 28 | 27 |
| 19 | 17 | 62 | 47 | 43 | 40 | 37 | 36 | 35 | 34 | 33 | 30 | 29 |
| 20 | 18–19 | 64 | 49 | 44 | 41 | 39 | 38 | 37 | 36 | 35 | 32 | 31 |
| 21 | 20 | 66 | 51 | 46 | 43 | 41 | 40 | 39 | 38 | 37 | 35 | 34 |
| 22 | 21 | 67 | 52 | 47 | 44 | 42 | 41 | 40 | 39 | 38 | 37 | 36 |
| 23 | 22 | 68 | 54 | 49 | 46 | 44 | 43 | 42 | 41 | 40 | 39 | 38 |
| 24 | 23 | 70 | 56 | 51 | 48 | 46 | 45 | 44 | 43 | 42 | 41 | 40 |
| 25 | 24 | 72 | 58 | 53 | 50 | 48 | 47 | 46 | 45 | 44 | 43 | 42 |

Copper Bronze and Gilding Tube, 3¢ ₱ lb additional

#### Iron Pipe Sizes—Brass

| ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 6 inch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 32 | 29 | 27 | 21 | 21 | 21 | 21 | 21 | 21 | 23 | 23 | 25 | 27 | 28½ | ₱ lb |

Copper, Bronze or Gilding Tubes, 3¢ ₱ lb additional

#### Brazed Brass Tubing.

*(To No. 19, inclusive.)* Jan. 6, 1899.

Brown & Sharpe's gauge standard.

| | | | | | Per ₱. |
|---|---|---|---|---|---|
| Plain Round Tube, ¾ in. up to 2 in. | | | | | $0.35 |
| " | " | ⅞ | " | ¾ " | .36 |
| " | " | 1 | " | ⅞ " | .38 |
| " | " | 1¼ | " | 1 " | .41 |
| " | " | 5-16 | " | 1¼ " | .48 |
| " | " | ½ | " | 5-16" | .63 |
| " | " | 3-16 | " | ½ " | 1.00 |
| " | " | ⅛ | " | 3-16" | 1.50 |
| Smaller than ½ inch | | | | | Special |
| ½ inch to 3 inch, to No. 19, inclusive | | | | | .38 |
| 3 inch | | | | | .40 |
| Over 3 inch to 3½ inch, inclusive | | | | | .45 |
| Over 3½ inch | | | | | .50 |

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5%

#### Roll and Sheet Brass—

*(Brown & Sharpe Standard Gauge.)*

| Common High Brass Wider than and including | in. 2 12 | in. 12 14 | in. 14 16 | in. 16 18 | in. 18 20 | in. 20 22 | in. 22 24 | in. 24 26 |
|---|---|---|---|---|---|---|---|---|
| To No. 20, inclusive | .24 | .23 | .25 | .27 | .29 | .31 | .33 | .36 |
| Nos. 21 22, 23 and 24 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .37 |
| Nos. 25 and 26 | .23 | .24 | .27 | .29 | .31 | .33 | .35 | .38 |
| Nos. 27 and 28 | .23 | .25 | .28 | .30 | .32 | .34 | .33 | .39 |

| Common High Brass Wider than and including | in. 26 28 | in. 28 30 | in. 30 32 | in. 32 34 | in. 34 36 | in. 36 38 | in. 38 40 | in. 40 |
|---|---|---|---|---|---|---|---|---|
| To No. 20, inclusive | .39 | .42 | .46 | .50 | .55 | .60 | .65 | * |
| Nos. 21, 22, 23 and 24 | .40 | .43 | .47 | .51 | .56 | .61 | .68 | |
| Nos. 25 and 26 | .41 | .44 | .48 | .52 | .57 | .63 | .71 | |
| Nos. 27 and 28 | .42 | .45 | .49 | .53 | .58 | .65 | .75 | |

* Special prices not less than 80 cents.

Add ½¢ ₱ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 35%

#### Wire in Coils. List February 26, 1896.

| Brown & Sharpe's gauge the standard. | Com. high brass. | Low brass. | Gild'g bronze and copper |
|---|---|---|---|
| All Nos. to No. 10, inclusive | $0.23 | $0.27 | $0.28 |
| Above No. 10 to No. 16 | .23½ | .27½ | .28½ |
| No. 17 and No. 18 | .24 | .28 | .32 |
| No. 19 and No. 20 | .25 | .29 | .33 |
| No. 21 | .26 | .30 | .34 |
| No. 22 | .27 | .31 | .35 |
| No. 23 | .28 | .32 | .36 |
| No. 24 | .30 | .34 | .38 |
| No. 25 | .32 | .36 | .40 |
| No. 26 | .35 | .39 | .43 |
| No. 27 | .38 | .42 | .46 |
| No. 28 | .42 | .46 | .51 |
| No. 29 | .45 | .49 | .54 |
| No. 30 | .48 | .52 | .62 |
| No. 31 | .51 | .55 | .67 |
| No. 32 | .55 | .59 | .73 |
| No. 33 | .59 | .63 | .82 |
| No. 34 | .64 | .68 | .95 |
| No. 35 | .70 | .74 | 1.30 |
| No. 36 | .76 | .80 | 1.50 |
| No. 37 | 1.00 | 1.04 | 1.70 |
| No. 38 | 1.30 | 1.34 | 2.00 |
| No. 39 | 2.00 | 2.00 | 3.25 |
| No. 40 | 2.60 | 2.60 | 5.75 |

Discount, Brass Wire, 37½; Copper Wire, NET. List November 16, 96.

Spring Wire, 2¢ ₱ lb advance.

#### Tobin Bronze—

| | |
|---|---|
| Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₱ lb, net | 17¢ |
| Finished Piston Rods, ⅝ to 2½ in. diameter, ₱ lb net, | 18¢ |

Other sizes and extreme lengths, special prices.

#### Spelter—

Duty: In Blocks or Pigs, 1¢ ₱ lb

Western Spelter ..... 5¼@5½¢

#### Zinc.

Duty: Sheet, 2¢ ₱ lb.

| | |
|---|---|
| 600 lb casks | 6½@6¾¢ |
| Per lb | 7@7¼¢ |

#### Lead.

Duty: Pigs and Bars and Old, 2½¢ ₱ lb. Pipe and Sheets, 2¾¢ ₱ lb.

| | |
|---|---|
| American Pig | 4.45@4½¢ |
| Bar | 5 @5½¢ |
| Pipe | 6½¢ ..... 20% off |
| Tin Lined Pipe | 12½¢ ..... 20% off |
| Block Tin Pipe | 35¢ net |
| Sheet Lead | 7½¢ ..... 20% off |

Old Lead in exchange, 3¼¢ ₱ lb

#### Solder.

½ & ½, guaranteed ..... 17 @17½¢

No. 1 ..... 14½@15 ¢

Prices of Solder fluctuated by private brand vary according to composition.

#### Antimony—

Duty, 2½¢ ₱ lb.

| | |
|---|---|
| Cookson | ₱ lb ..@9½¢ |
| Hallett's | ₱ lb 7¾@7¾¢ |
| U. S. | ₱ lb 7¼@7¾¢ |

#### Aluminum—

Duty: Crude, 8¢ ₱ lb. Plates, Sheets, Bars and Rods, 13¢ ₱ lb.

| | |
|---|---|
| No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting: Small lots | ₱ lb 37¢ |
| 100-lb lots | ₱ lb 35¢ |
| No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting: Small lots | ₱ lb 34¢ |
| 100-lb lots | ₱ lb 33¢ |

Aluminum Sheet, B. & S. gauge. 50 lb or more

| | 6-in. | 14-in. | 24-in. |
|---|---|---|---|
| Wider than | 14 in. | 24-in. | 30-in. |
| And including | ₱ lb. | ₱ lb. | ₱ lb. |
| Nos. 13 to 19 | $0.43 | $0.44 | $0.47 |
| No. 20 | .44 | .46 | .49 |
| Nos. 21 to 24 | .46 | .48 | .51 |
| No. 25 | .46 | .50 | .53 |
| No. 26 | .47 | .51 | .54 |
| No. 27 | .47 | .54 | .59 |
| No. 28 | .48 | .57 | .62 |
| No. 29 | .48 | .57 | .64 |
| No. 30 | .49 | .60 | .69 |
| No. 31 | .50 | .64 | .77 |

*Note.*—Lots of less than 50 lb 5¢ ₱ lb extra.

Aluminum Wire, B. & S. Gauge.

| | | | |
|---|---|---|---|
| Larger than No. 9 | ₱ lb 40¢ | No. 15 | ₱ lb 43¢ |
| No. 9 to No. 10 | ₱ lb 40½¢ | No. 17 | ₱ lb 50¢ |
| No. 11 | ₱ lb 41 ¢ | No. 18 | ₱ lb 55¢ |
| No. 12 | ₱ lb 41½¢ | No. 19 | ₱ lb 60¢ |
| No. 13 | ₱ lb 42 ¢ | No. 20 | ₱ lb 65¢ |
| No. 14 | ₱ lb 43½¢ | No. 21 | ₱ lb 85¢ |

#### Old Metals.

*Dealers' Purchasing Prices Paid in New York.*

| | |
|---|---|
| Heavy Copper | ₱ lb 9½¢ |
| Light and Tinned Copper | ₱ lb 8½¢ |
| Heavy Brass | ₱ lb 7 ¢ |
| Light Brass | ₱ lb 5½¢ |
| Lead | ₱ lb 3½¢ |
| Tea Lead | ₱ lb 3 ¢ |
| Zinc | ₱ lb 3½¢ |
| No. 1 Pewter | ₱ lb 17½¢ |
| No. 2 Pewter | ₱ lb 8½¢ |
| Pure Aluminum, Sheet, ₱ lb | 22¢ |
| Cast Aluminum, ₱ lb | 17¢ |
| Tin Plate Scrap | ₱ ton $15.50@16.20 |
| Wrought Scrap Iron | ₱ gross ton $15.50@16.75 |
| Heavy Cast Scrap | ₱ gross ton $15.50@16.00 |
| Stove Plate Scrap | ₱ gross ton $11.00@11.50 |
| Burnt Iron | ₱ gross ton $8.00@ 9.50 |